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Bulletin

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AN OUTLINE FOR THE RATING OF HOSPITALS *

WILLIAM EVERETT MUSGRAVE, M.D.
SAN FRANCISCO

DEFINITION

A hospital is an institution suitably located, constructed, equipped, organized, managed and personneled to supply, scientifically, economically, efficiently and unhindered, all or any recognized part of the complex requirements for the prevention, diagnosis and treatment of physical, mental and the medical aspect of social ills; with functioning facilities for training new workers in the many special professional, technical and economic fields essential to the discharge of its proper functions; and with adequate contacts with physicians, other hospitals, medical schools and all accredited health agencies engaged in the better health program.

A hospital that fulfils this definition is the ideal general hospital; one that fulfils it with the exception of neuropsychiatry and contagious diseases may be appropriately designated a "limited general hospital;" and one occupying a less inclusive field may be classed as a "special hospital." The character and degree of limitation of special hospitals may be appropriately indicated by prefixes and suffixes to the name.

Under this definition, fair rating of hospitals is not dependent on size, character of ownership and management, the inclusiveness of its field of activities, its architectural beauty, or any other of its more material qualities, except so far as they affect function.

Rating and classification should be definitely and specifically based on the unhampered fidelity, efficiency and effectiveness with which a hospital discharges the three fundamental functions of every hospital, which are: (1) *service for those who are ill,* (2) *service in the prevention of disease and* (3) *service in education and research.*

Some of the points which are part of the betterment program of hospitals and which should be considered in rating are:

(*a*) The appropriateness of a hospital of the character and scope of the one under consideration in the community in which it is located. This applies particularly to smaller communities where appropriations, funds for medical purposes and other policies are closely scrutinized.

(*b*) The efficiency with which the hospital is discharging its duties.

(*c*) Its financial and organizational ability to discharge its obligations and to insure a reasonable degree of permanence and progress.

(*d*) The practical, every-day ethics and spirit of service that are guiding the organization management and workings of the hospital.

(*e*) The genuine, practical attitude of the hospital toward improvements, medical organization and better medicine.

(*f*) Its absolute freedom from political or other influences, except those of unselfish, sympathetic, scientific progress.

CLASSIFICATION AND RATING

The designations employed to express hospital ratings under the plan outlined are:

Class A hospitals (from 90 to 100 per cent.): Excellent hospitals requiring little or no improvement; findings and percentages arrived at by giving due weight to all points covered in this outline that are fairly applicable to the hospital in question.

Class B hospitals (from 75 to 90 per cent.): Acceptable hospitals needing some improvement; findings and percentages arrived at by giving due weight to all points covered in this outline that are fairly applicable to the hospital in question.

Class C hospitals (less than 75 per cent.): Unacceptable hospitals that require extensive changes in order to render the services considered essential in a satisfactory manner.

Published lists of hospitals might well include only the A and B hospitals.

Starred (*) hospitals: Starred hospitals are those of A and B ratings that have provisions for furnishing acceptable training to fifth year medical students (interns).

The data necessary to make a fair rating of any hospital are included in this outline. These data are also arranged more conveniently as a work sheet in the survey blank provided for the purpose by the Council on Medical Education and Hospitals of the American Medical Association, and as used in California by the League for the Conservation of Public Health.

It is, of course, obvious that surveys always should be made by thoroughly trained physicians with executive hospital experience whose only interest in the hospital is a sincere desire to aid the hospital with its problems. Surveys should be conducted by personal examination, including conferences with hospital trustees, executives and staff.

GENERAL CONSIDERATIONS

The following important points should be given serious consideration in rating the usefulness of any hospital:

Suitability.—(Particularly for smaller hospitals away from larger cities.) There should be a real need for a hospital of the character of the one under consideration in the community it serves. Important factors in determining this point are:

* This article is published in full in reprints, which may be had from the Council on Medical Education and Hospitals of the American Medical Association. Many important details are omitted in THE JOURNAL article, owing to lack of space.

The distance of the hospital from other hospitals; the number and social and economic status of the population; the adequacy of all existing arrangements for the care of all the sick. The number of physicians; the physical conditions as to roads and methods of transportation; the degree to which specialization is practiced by the physicians and to which the public is prepared to accept specialization.

Location.—The hospital ought to be located advantageously as to sanitary conditions, such as noises, smoke, dust and ventilation. Roads, transportation, parking, room for expansion and general surroundings should be taken into consideration. The amount of grounds, the general surroundings and other features of privacy and attractiveness should depend somewhat on the purposes of the hospital.

Buildings.—Any fair rating must consider the character of construction; repair; arrangements for economical service; fire resistance; plumbing; facilities for the disposal of waste, garbage and sewage; roof gardens and solariums; heat; light; refrigeration and water supply, and provisions for housing, feeding and otherwise caring for officers, nurses and employees.

Of all material features of the hospital, the most important are arrangements for private, economical and efficient care of the sick, and for protection against accidents, fire and communicable disease hazards.

Within these and other less important limitations, the greater the individuality in architectural and furnishing ingenuity displayed for the comfort and well being of the sick, the more credit the hospital should have.

Equipment.—The hospital, to be worthy the name, should have general, special and departmental equipment, adequate for all the requirements of diagnosis and treatment, as well as for the safety and comfort of all persons. Ample provisions should be made in particular for sterilization and disinfection; for the protection and preservation of perishable products, and for the proper conduct of all the departments and services included in this outline that come within the scope of the hospital under consideration.

Financial Status.—Money invested in a hospital may earn a legitimate income upon itself, if it can be made to do so without in any way interfering with the excellence of the services rendered. Except in private hospitals income on investment is almost never made. A hospital may or may not make a financial profit without in any way detracting from its standing, provided that under no circumstances shall its earning exceed current bank rate of interest. Earning as used here includes dividends, funds spent in increasing the value of the property, or in any other way made to enrich the owner or other investor. Few mixed service hospitals make profits, and those that do usually use such profits in the interests of better medicine for the less fortunate. A hospital that pays in dividends or otherwise in material returns to its owners in excess of the fair working value of money should receive most careful consideration in rating. On the other hand a hospital financially insolvent or where lack of funds is affecting the quality of service should also be carefully considered.

EDUCATIONAL WORK

It is hard to conceive of an organization that can render good service to the sick which by that fact is not prepared also to give instruction. There are no schools for the training of many classes of special help that hospitals require. Each must train its own people, and its activities in this line may be subjects for consideration in its rating.

Whatever the theories and future of the education of nurses, at present it is practically all done in hospitals, and the facilities, personnel and equipment and performances of any hospital that undertakes to operate a school of nursing should be considered in its evaluation.

Technicians of several classes are essential to good hospital, dispensary and "follow-up" service. When hospitals include instruction of any class of technicians as one of their functions, the facilities and methods used should be noted.

Education and training of physicians of the staff, visiting physicians, residents, and "house officers," by association and contact, if in no other way, is an unavoidable responsibility of every hospital. Those hospitals that recognize and feature this duty deserve special notice and special commendation.

The Education of Interns: This is one of the most important functions of any hospital that undertakes this duty. It should be remembered that interns looking for accredited instruction are real fifth year medical students, and they should be given what their curriculum calls for. The fact that in discharging their proper duties as students they at the same time render service of value to the hospital should always be recognized as purely incidental. Hospitals not prepared to give interns all that they should have as students should employ other physicians as residents or assistant residents for required work. (See reprints for elaboration of this point).

Community Services.—In a number of places in this outline provision has been indicated for various community duties and responsibilities. Under the hospital department of public health or in some other department these should be brought together for contact with other organizations and with the public. If hospitals are to continue to progress along sound lines and take their proper places before the public all of this class of duties that may be classed as medical must be brought more and more into the scheme of hospital betterment. A hospital conceived and operated along the lines indicated becomes the ideal practical, effective community clearing house in all matters pertaining to health. Particularly is this true with hospitals in small centers.

Ethics.—A careful examination of the ethics practiced by any hospital, as an organization, will provide an excellent index not only to what the hospital stands for, but also as to what is going on in every one of its departments. Certainly, in all of its professional work and professional contacts the ethics of the medical profession should prevail, and it is quite worth while to encourage hospitals to adopt the Principles of Medical Ethics as their guide wherever applicable.

VOLUME AND VARIETIES OF CLINICAL SERVICE

While not essential to purposes of this outline, knowledge of the volume and varieties of clinical services offered by any hospital is interesting and important. This should be shown by the average number of patient days for each and every kind of service rendered by the clinical departments.

ORGANIZATION

The hospital should have not only a paper organization, but also an actual working one, involving its every function and activity, from its ownership and governing body to the smallest and least important of its services.

Division of authority in hospitals and the practice of "farming out" certain services sometimes seen encourages disharmony and inefficiency. This outline constitutes a unified organization for a complete general hospital.

More limited and smaller hospitals are expected, of course, to combine a number of the departments and services under one heading:

Ownership.—This may be national, state or municipal government; a religious or fraternal body; a business corporation; a community; private stockholders or any other group of people, or an individual. Ownership, in the sense used, should be clearly understood and defined; but whatever it is, it should make no difference in what the hospital ought to be.

Contacts.—The methods and manner of contact between the organization and (*a*) its owners, (*b*) the public, (*c*) other organizations and (*d*) the medical profession, in particular, should be clearly outlined and practiced.

Governing Body.—Every hospital should have a board of directors, a board of trustees or other governing body vested with wide legislative, policy-making and judicial authority. The manner of election, appointment or other method of designation should be shown, together with whatever opportunities there are for the intrusion of vested or selfish interests.

In any but private hospitals, none but able, broad minded, public service loving persons should hold positions on a hospital board. The slightest personal, political or other form of limited interest should disqualify for such service in any but a private hospital. Likewise, personal remuneration in money or service or incompetence should constitute ineligibility. All of these points should have due weight in the rating of any hospital.

Professional Work.—The lack of effective coordinated action in the professional care of the sick and the inherent difficulties in securing efficient staff organization is a major problem in any program of hospital improvement. There are numerous kinds of so-called staff organizations, and there is an ever decreasing number of laymen and physicians who still wish to consider a hospital an open hotel that may allow any one with the title of "doctor" to patronize it. Fortunately, judicial decisions by many courts on many different points are assisting in clarifying this situation.

Without attempting to set up any one specific staff organization, and with the understanding that any effective team-working staff organization is acceptable, it is only just to mention some essentials to good work in any hospital by any staff.

Administrative and Executive Authority.—This should be vested in a single individual, the director, superintendent or manager. This officer should be appointed by and hold office at the pleasure of the board of directors. He should be responsible to them solely, and every officer and employee of the hospital should be responsible to him. He should have no other interests; should be paid an adequate salary, and should, of course, measure up to his responsibilities in education, training, experience and practices.

The director should have as his assistants as many heads of departments and services as the size of the institution and the character of its work make necessary. These must all be appointed on his nomination, and those of secondary importance should owe their employment to him.

Having now brought our consideration into the hospital, as it were, the more definite internal organizational arrangements by departments may be taken up. This will be done by arbitrarily grouping these departments as: (*a*) clinical group; (*b*) general utility group, and (*c*) administrative group.

In large hospitals, each of these groups should have a head who may with advantage also hold an administrative title of assistant director of the hospital; or all of these officers may be members of the administrative board mentioned above. In smaller hospitals, it usually is necessary to consolidate many of the professional departments as well as the public utility and even the administrative departments. Such consolidations when wisely considered need not detract from the hospital's efficiency.

In small and certain special hospitals, the director may handle all administrative work and some of the professional work as well. However, the director never, under any circumstances, should be a competitor of staff members in practice.

In using this arrangement, or any other, it is necessary to bear three important facts in mind, for they apply to every department, division and person and should be constantly carried out in every hospital. These are:

(*a*) Each department or service must have an effective, overlapping contact with every other department and service.

(*b*) Each department and the hospital as a whole must so arrange its work as to provide for constant day and night service to care for emergencies and to meet all special requirements necessary to safeguard its public.

(*c*) Every department, service and person in the whole organization has definite duties to perform in:

1. The discharge of routine duties.
2. The education and training of others.
3. Efforts to secure and apply new knowledge.
4. Cooperation with and assistance to all other services.
5. Understanding the essential team work of all services as parts of a whole devoted to the prevention, diagnosis and treatment of disease and the education and training of other workers.

Clinical Group.—In preparing an outline of this important group of departments, divisions or services, it appears advisable to follow the classification largely followed in medical schools, *although any other efficient arrangement may be recognized in rating.* It should be remembered that medicine as now practiced in some cities is highly specialized, while in smaller centers "general practice" is still and always must continue to be the rule. For that reason, if for no other, it is necessary to make provision in our outline for the general practitioner, and this may be conveniently done by recognized general practice as a clinical department. In small hospitals it may be the only possible department and in more urban communities it may be omitted entirely.

Industrial medicine and surgery is, in effect, a form of "group practice" rather than a specialty. It differs from other practices chiefly in organization which insures coordination of effort; in records based on both scientific and "official" accuracy, and in provision for adequate, prompt written reports considered from professional, legal and economic points of view.

On account of the character of laws in some states and the practices and procedures in some other states; on account of the extent of this work and its influence on the profession and on hospitals, equipment and other facilities, it is given a place in this outline.

A department of this character may help some hospital organizations in "fitting in" insurance company staffs, medical departments of industrial plants, social, fraternal and other organizations. This arrangement also provides a method of bringing into this outline the large number of exclusively industrial medicine and surgery hospitals. Groups, including industrial medicine, when formed by the physicians practicing ethical medicine may be dealt with as "units of professional service," and the group, in this sense, is entitled to exactly the same consideration and ethical coverage as an individual physician.

In estimating the efficiency of the work of clinical and other staff departments, it is well to reiterate that all departments and staff members, in addition to their direct duties to the sick, have decided responsibilities toward other clinical departments; all general utility departments; all administrative departments, and to the hospital as a whole. In no other way can prompt consultations between departments be made, and time-saving efforts of general utility and administrative departments be coordinated in arriving at diagnoses and giving treatment in an effective and prompt manner.

The importance of the educational function of clinical departments cannot be emphasized too frequently. The head of every department and service has an obligation to physicians and interns (if any) second only to his duty in the care of the sick.

The departments and divisions of the group of clinical departments as used in this outline are shown below. The list is furnished as a guide. It is realized that most hospitals will have only part of these departments and that some special hospitals will be limited to only one. Any combination of departments is acceptable, provided only that those recognized are clearly understood and are doing effective work.

(*a*) General practice.

(*b*) Industrial medicine and surgery; also other forms of "group practice."

(*c*) Medicine and medical specialties:
1. General medicine.
2. Pediatrics.
3. Communicable diseases.
4. Neuropsychiatry.
5. Dermatology.
6. Tropical medicine.
7. Tuberculosis.

(*d*) Surgery and surgical specialties:
1. General surgery.
2. Otorhinolaringology.
3. Ophthalmology.
4. Urology.
5. Orthopedic surgery.
6. Anesthesiology.

(*e*) Obstetrics.

(*f*) Dentistry.

(The departments of pathology and clinical laboratories, radiology and public health, although staff departments, are classed with the general utility group below because of their duties to all clinical departments.)

Members of the resident staff, other house officers, interns and other students should be classed as assistants in their various departments. In larger hospitals they also may have their own organization and meetings for discussion of their responsibilities to the hospital administration, as well as for review of their work and methods of improvement. The senior, or executive resident of larger hospitals, should have definite professional and administrative responsibilities and authority. This same principle should apply in smaller hospitals with only one resident. The resident should be a full-time salaried official of two or more years of hospital experience.

The General Utility Group.—In a sense, all departments are general utility, but in this group are included those departments and services the major portion of whose functions are for and in cooperation with various other departments. These departments are both professional and technical. They include:

(*a*) Pathology and clinical laboratories (as one or as two departments).

(*b*) Public health department of the hospital (administration only of the outpatient departments; contact and methods of cooperation with other organizations may be by the public health department or by some other administrative officer).

(*c*) Radiology (including roentgenology and radium).

(*d*) The school of nursing and nursing services (including operating room).

(*e*) Public health nursing, medical social service and "follow-up" service.

(*f*) Library and clinical records (as one or as two departments).

(*g*) Pharmacy.

(*h*) Physiotherapy (including all forms of physical therapeutics, occupational therapy and vocational training.

Psychotherapy, while a specialty, has much in common in equipment, personnel and methods with physiotherapy. It may be combined with physiotherapy for purposes of economy, or it may be added as a separate department.

Pathology and Clinical Laboratories: This important department should be in charge of a competent pathologist. Only large general hospitals can have enough work to occupy the full time of a competent pathologist, and there can be no serious objection to the pathologist being head of the service in two or more hospitals, dividing his time between them. The pathologist should have regular hours for consultation with the clinical departments and there should be arrangements for his presence at operations at which quick diagnosis is required.

Public Health: Comparatively few hospitals have a public health department or a public health officer, and yet there is no more important or necessary service, particularly in larger hospitals, than that only efficiently rendered by such a department. The common practice by which clinical departments, nursing service and administration handles the problems of epidemiology, hygiene, ventilation, disinfection and similar public health services of the hospital, without system or organization, is not satisfactory from the standpoint of the patient, the hospital, the public and the profession.

Safety to the public, to other patients and to officers and employees, and particularly proper education in public health matters for interns, nurses and others makes a department with a hospital health officer in charge a much to be desired service in any hospital. This department should never invade the field of clinical medicine, and should have no individual patients. Every patient and other person in the hospital, as well as all of its facilities, should operate under the instruction of the staff health officer in all matters pertaining to public health and safety. In particular should the health officer take command and issue all instructions for the control of infection when such develops in the hospital. He may be the official medicolegal officer of the hospital, or other definite arrangements may be pro-

vided to render this service. The constantly increasing importance of medicolegal work, and the small amount of attention given to it in medical schools, emphasize the importance of centralizing the service in hospitals for legal protection, purposes of instruction and for the welfare of all persons.

Radiology: Radiology is used in all branches of medicine sufficiently to warrant its consideration as a necessary department of every good hospital regardless of its size. The department should have adequate space and the best of equipment, and its records should form parts of the consolidated case record of every patient.

The department should be in charge of a competent radiologist, who should be available for consultation by clinical men daily at definite hours. There should be such technicians and other help available as the volume and character of the service require.

The School of Nursing and Nursing Service: This exceedingly important department of every hospital is the best example of what a technical department should be. In its educational work, it should be a school; in its practical work, it is a service department working and recording for all other departments.

The department should be in charge of an educated, experienced nurse who is responsible to the director of the hospital in all matters and to various departments for efficient nursing. She should have as many assistants as the size of the hospital and the work make necessary. There should be one or more instructors, who should also be the counselors and advisors of the students.

If there is a school of nursing, it should be a school and not an excuse to get cheap service for the sick. The nurses, and particularly student nurses, should have comfortable home and social surroundings. Their curriculum should be carefully planned and carried out. They should have regular hours of duty and practical instruction under unit supervisors in addition to their regular class room and laboratory instruction.

Nursing Units: It has been said that a good hospital is a group of nursing units of from fifteen to thirty rooms or beds, and that each nursing unit should be in contact with other nursing units, with all departments of the hospital and with the public through the superintendent.

Public Health Nursing and Medical Social Service: When the scramble for overspecialization has subsided, it is going to be difficult to differentiate between public health nursing and the kind of medical social work that is useful to physicians or hospitals.

Whether organized as one or two departments, these services are important. The economic and social diagnosis, accurately and sympathetically made, should be the second sheet of most clinical case records. Notes and reports of further study and treatment and particularly "follow-up" work should also be appended to the original record with as much care as the nurse uses in her records.

Clinical Records and Library: These two important services are so welded together in their functional uses that many good hospitals operate them as one department. The department should be in charge of a thoroughly trained record clerk who also knows something of library work. She should be directly responsible to the director of the hospital, and she should work as a technical assistant to all clinical departments. Large hospitals will require one or more full-time technicians in this department, and smaller ones may not need more than the time of one clerk. There is, of course, no objection to having these services separated in hospitals that can afford the expense.

Records and indexes and statistics from clinical records can be only as complete and efficient as are the written diagnoses which must be entered by the physicians. Each and every disease or abnormality of each and every patient should be entered in the appropriate place on the record. This should be done for each diagnosis, regardless of any probable or possible connection with any other diagnosis. Good hospital records will show an average of from two to four diagnoses for each patient. The efficiency and completeness of clinical records, including the special records from all departments, such as radiology, pathology and clinical laboratories, public health nursing, social service and adequate "follow up" records and including their indexing and permanent filing as individual records, furnish the best indication of the quality of professional work of a hospital, and the findings should be given material weight in the rating of any hospital.

Wherever physical conditions will permit, the hospital and outpatient record systems should be consolidated. Where this is impracticable they should be closely coordinated by one of the good methods in use in many hospitals. The clinical record secretary should render a monthly report of the department to the director of the hospital. Sample forms for this purpose may be secured from the Council on Medical Education and Hospitals of the American Medical Association or from any other organization, or a set may be designed by the hospital.

The library should be ample in size and attractive in furnishings, and should contain at least one late edition standard textbook on each specialty of medicine, as well as at least one "system" of medicine for reference. There should be current subscriptions to at least fifteen good medical and hospital journals, and files of each of these journals should be bound and built up through the years.

Pharmacy: All but the smallest hospitals should have a well located, well arranged prescription pharmacy in charge of a registered pharmacist. The department should be charged with keeping track of narcotics, alcohol and anesthetics. Certain pharmacy supplies and even toilet articles should be kept in stock. The manufacture of stock preparations and the careful filling of prescriptions, of course, constitute the main duty of the department. A good pharmacist will be of use to laboratories, diet kitchens, clinics and, in fact, to many departments of the hospital.

Physiotherapy: Physiotherapy, used in the sense that includes all forms of mechanical and physical therapeutics, occupational therapy and vocational training should constitute a department in every hospital of sufficient size.

Psychotherapy, while a specialty in its service, has so much in common with physiotherapy in space, equipment and general requirements that at least for administrative purposes and general departmental organization it may be combined with physiotherapy in all but the largest or certain special hospitals. Any other arrangement for these services either as separate or consolidated departments that assures good, economical service and good records is acceptable.

The chief technician in charge of either or both of these departments should be responsible to the hospital

director and to the members of the staff for proper execution of their prescriptions in much the same way that other technical departments are conducted. In the large and certain special teaching hospitals where a physician is limiting his practice to this field, he may be appointed to the staff as head of this department.

Administrative Group.—In this group is included a number of essential functions which may be held together as one department or spread out into several departments or divisions, as the size and character of the hospital require. These are:

(*a*) General office administration.
(*b*) Finances and accounting.
(*c*) Clerical and records and office filing.
(*d*) Property, supplies and transportation.
(*e*) Engineering, buildings and grounds.
(*f*) Laundry and laundry service.
(*g*) Subsistence and dietetics.
(*h*) General service (including janitors, porters, maids and other unskilled employees and services).

General Office Administration and Financial Services and Records: The hospital, however small, should have these services, and some person should be in charge and responsible for adequate:

(*a*) Information, telephone and messenger service.
(*b*) Admission and assignment of patients, with follow-up and "social hostess" service to patients and visitors.
(*c*) Adequate records of correspondence, admission and business records of patients, bookkeeping records, cashier's duties and records, patients' effects, service and records, and all other functions of a business office.
(*d*) Financial and statistical records should be on a business basis, and a monthly report, including at least the data discussed under "volume and varieties of hospital work" in this outline should be furnished.

This important function of hospitals is in bad shape. The majority have no accounting system. Many others use methods that are useless. Some have good systems of classification of costs and of accounting. Even these are not uniform. Any good business system must classify its costs upon a functional service basis. The rest of the accounting problem is similar to any complex organization. Hospitals that are making some effort in this direction should be encouraged.

The ability to make a monthly report of this character is a very good test of the efficiency of office administration and of the way departmental data are correlated.

Telephones and intercommunication with sufficient outgoing and incoming "trunks" and a constant twenty-four hour a day switchboard service is as necessary to a hospital as it is to a police department. An effective inter-departmental communicating system, either as an extension of the telephone system or as one of the dictograph types, is also necessary in all but the smaller hospitals.

Property and Supplies: This should be a separate department in charge of an experienced purchasing agent and property officer. In small hospitals, this service may be handled by the accountant and office superintendent as part of his department. In any event, there should be a competent person in sole charge of every bit of property of whatever character and wherever located belonging to the hospital. He should have adequate storerooms, records and assistance. All purchases should go through his hands, and there should be a business system of "internal requisitions" for issue of supplies, checking of waste and control over property in general. Some of the various group or association methods of purchasing in use in various places in the country effect savings in the cost of supplies.

Transportation facilities for the sick to and from the hospital should be reckoned as an essential service of any hospital. The hospital may either own its ambulances or have a definite understanding with other agencies to furnish such service promptly on call.

Engineering, Buildings and Grounds: This department should be in charge of a competent reliable engineer, who should be responsible to the director of the hospital. In personnel, it should include engineers, electricians, plumbers, carpenters, painters, gardeners, elevator operators, and the like. The services of the department should include the operations of the power plant; repairs and alterations to buildings; repair and operation of elevators; refrigeration, including the main plant and any subsidiary units; distilling of water; radiation and temperature regulations in all buildings; repair of all equipment, including sterilizers and the sharpening of instruments; care and upkeep of the grounds; care and upkeep of ambulances and other vehicles; the operation of the central sterilizing and disinfecting plant; shops for the manufacture and adjustment of splints, and dozens of other similar functions.

All but the smallest hospitals should have their own power, heating and sterilizing plants. Court judgments against hospitals for neglect in providing pressure steam for sterilization and similar services being responsible for infections emphasizes the importance of considering the efficiency of power plants as part of the essential equipment of a hospital. Whenever a hospital has no plant of its own it is well to examine most carefully into substitutes employed to cover this deficiency, to determine as to their effectiveness and reliability.

Laundry and Linen Service: This department should be in charge of an experienced laundry foreman, responsible to the director for all personnel and services. All linen and other washable supplies in the entire hospital should be under his charge, including a manufacture and repair sewing service with emergency stores. The department should operate on a requisition system with all services, and should be charged with the responsibility for the care of unclean linen and with the duty of delivery of clean materials to the various linen closets throughout the hospital. The division of the responsibility for this service between nurses, housekeeper and a laundry foreman rarely is satisfactory and nurses should not be taken from nursing duties to render or oversee this service. Clean linen should be supplied to them by a consolidated laundry and linen service just as drugs are supplied by a pharmacy. Small hospitals should be encouraged to install laundry machinery for their mangle work at least.

Subsistence and Dietetics: This service may be discharged by one or by two separate subdepartments. If by two departments, the dietitian should make intimate contact with the physician and the patients as a technician working under the orders of the physician. She may submit the simple food prescriptions to the chef and have her own force prepare the particular scientific diets. A single department with a high grade combined practical and scientific dietitian in charge of the entire subsistence department constitutes

the ideal arrangement. Whatever the arrangement about division of service, for all purposes of costs, organization and good, pleasing service to patients, it should be held as one department. Until more progress is made in the development of the practical side of dietetics as a technical specialty, most good hospitals will continue to place a good chef or steward in charge of the subsistence service, and give to dietitians only such responsibilities as they are capable of assuming.

The subsistence department should prepare and distribute all food to the unit diet kitchens throughout the hospitals, and in some good institutions employees of the department take complete charge of the preparation and serving of food. Surely waiter and "bus boy" service can be cared for without taking too much of the nurse's time except for scientific diets.

Careful records, both technical and financial, should be provided for and at least a weekly report of costs of meals should be furnished to the hospital director.

The subsistence department also should have complete charge of and should operate with its own help all dining rooms, special kitchens and, in general, the food service for all persons.

Janitor and General Service: This department should be in charge of a competent foreman of labor. He should employ, discharge and supervise the work of all unskilled labor. The department should be responsible for the cleanliness and orderliness of all parts of all buildings, except such as are placed specifically under other departments; and, in many good hospitals, this department serves as the employment and timekeeping service for other departments.

CONCLUSION

It has been my purpose to outline what is most essential in a hospital and to extend that outline through the entire organization so as to provide a working method for surveying and rating a hospital by functional tests of all of its services.

Viewed from one angle, the outline appears long and quite inclusive. However, when examined critically, it is seen that important services are only sketched and some are barely mentioned. No attempt has been made to mention more than a few of the important duties and responsibilities of most departments. Numerous more extended articles by experienced authors are to be found in recent literature going into details of various individual departments and functions only barely sketched here.

Butler Building.

Shock and Exhaustion.—Exhaustion may be produced by want of food or drink or oxygen; by exposure to cold or wet; by want of sleep; by a period of excessive muscular or mental work; by a prolonged emotional strain-worry or anxiety; by defense against chronic infection and by failure to eliminate waste products. Low blood pressure and subnormal temperature are not marked features of exhaustion. Shock on the other hand is commonly caused by a more abrupt overwhelming stimulus-physical injury, intense emotion, acute infection, anaphylaxis, etc. In shock, the brain is more rapidly impaired; the power of the brain cells to transform potential into kinetic energy is more suddenly broken; consequently the organism cannot perform its normal work, and metabolism collapses; the temperature is subnormal; there is general prostration.—G. W. Crile, "A Physical Interpretation of Shock, Exhaustion and Restoration," 1921.

A PECULIAR DISCOLORATION OF THE SKIN

PROBABLY RESULTING FROM MERCURIAL COMPOUNDS (CALOMEL) IN PROPRIETARY FACE CREAMS *

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A limited number of drugs and chemicals are known to produce a fixed discoloration when applied to the surface of the skin. Olson [1] has carefully summarized our present knowledge of the localized argyrias. Pusey [2] describes an interesting pigmentation resulting from a solution of the sulphate of iron used in dressing dermatitis. Tattooing is, of course, familiar. The pigmentation resulting from the application of heat and irritating chemicals, such as mustard, cantharides and croton oil, are secondary to inflammatory changes and can usually be readily traced to the offending agent. I have not been able to find any reference in the literature to persistent discoloration resulting from the use of mercurial cosmetics.

Recently, we have had the opportunity to observe two patients with such a pigmentation, resulting apparently from mercurial salts in a face cream.

REPORT OF CASES

CASE 1.—Miss C. A., aged 45, a schoolteacher, who was first seen Dec. 27, 1920, complained chiefly of discoloration of the face and of insomnia. The skin of the eyelids, nasolabial folds and chin and the folds of the skin of the neck were a brownish-gray or slate color. At a distance of several feet, the discoloration reminded one strongly of the dirty neck and face of a boy who has limited his ablutions to Tom Sawyer's minimum. In fact, this teacher's pupils had remarked that she did not wash her face properly, and some of her co-workers had, in a bantering manner, passed similar comments. A well-known dermatologist had told her that he considered the discoloration to be due to a metallic deposit but that he could not identify the source. He had evidently not suspected the face cream.

Inspection with a 10-diameter lens showed that the discoloration of the affected areas was due to minute black puncta in the stomata of the individual glands and in the follicle mouths of the skin. The greater intensity of the pigmentation in certain parts could probably be accounted for by a redundance of the skin and the large size of the glandular openings in these regions.

A painstaking general examination of the patient, including studies of basal metabolism and endocrine function, revealed nothing of note. The patient would not permit a biopsy on the pigmented parts. An attempt was made to gather enough material for chemical examination by scraping the superficial layers of the skin but nothing could be removed in this way. The patient, however, had with her a jar of her favorite face cream, a widely known preparation, which she had used for fifteen years. This was analyzed by Osterberg of the section on biochemistry, and was found to contain large amounts of bismuth and mercury. Owing to the fact that the pigmentation involved only the areas over which this face cream had been applied, and in consideration of the evident superficial character of the pigmentation, it was strongly suspected that one of these chemicals might be the causative agent. Further study of this patient could not be carried out.

CASE 2.—Mrs. K. H., aged 31, who was seen for the first time, March 21, 1921, presented virtually the same type of

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* From the section on dermatology and syphilology, Mayo Clinic.
* Read before the Section on Dermatology and Syphilology at the Seventy-Third Annual Session of the American Medical Association, St. Louis, May, 1922.

1. Olson, G. M.: Argyria Localis Due to Organic Silver Preparations, J. A. M. A. **69**: 87-90 (July 14) 1917.
2. Pusey, W. A.: The Principles and Practice of Dermatology, New York, D. Appleton & Co., 1917, p. 958.

discoloration of the face and neck as that in the patient in Case 1, only the pigmentation was less pronounced. The discoloration of the face had been noticed for about four years. The patient herself had begun to suspect that it was probably due to the face cream she had been using, but believed that part of it was the result of "liver trouble." A general physical examination revealed one infected tooth and some slight tenderness over the gallbladder region, but was otherwise negative. Cholelithiasis was suspected, the opinion being based chiefly on the patient's statement of symptoms.

OBSERVATIONS MADE ON CHEMICALS IN FACE CREAM

A number of experiments were made on this patient. She would not allow a biopsy on the skin, since she could not be assured that there would be no scar. Superficial scrapings of the skin were made, but not enough material was obtained for a reliable chemical examination. This patient's face cream was of a different brand from that used by the patient in Case 1. This preparation also was examined by Osterberg, who reported that of active chemicals it contained only mercury, probably in the form of mild mercurous chlorid. This report was confirmed by the patient, who said that she had seen a report of a chemical examination of her favorite face cream in one of the popular journals. The report stated that the cream was a suspension of mild mercurous chlorid. The experiments performed to determine the effect of the face cream on the skin were materially simplified by the fact that the cream contained only one active chemical ingredient. It could thus be argued that its behavior could be attributed to the action of mild mercurous chlorid.

An attempt was made to dissolve the black deposit on the patient's skin by various solvents. Water, soap and water, ether, acetone and dilute acetic acid were used in succession. None of these had the slightest dissolving or decolorizing effect on the deposits. The failure of these agents can be readily understood when it is considered that practically all of the pigment was confined in the glandular openings and probably the ducts and was therefore not very accessible. On several occasions, the cream was applied to the cubital region of the patient's arm under bandages. These bandages were left in place for forty-eight hours, and the patient was requested to take long walks. On one occasion, the patient perspired freely while the cream was in place; the skin was not discolored.

A similar method was followed in order to determine whether the reaction of the perspiration was acid or alkaline. Pink and blue litmus paper was bandaged on the skin instead of the cream. The pink paper always turned a light blue, and there was no change in the blue paper. This suggests that the secretions were slightly alkaline. Whether this alkalinity was the sole factor in the production of the black deposit it is difficult to determine. It is impossible to argue that the alkalinity of this patient's secretion was the only factor in the production of the discoloration. Physiologists evidently do not agree on the reaction of the sweat in normal persons. Zuntz and Loewy [3] say that pure sweat is usually acid in reaction, and only occasionally alkaline or neutral. Landois [4] and Stirling express the view that the reaction of sweat is alkaline, although often rendered acid, after secretion, by admixture of fatty acids from decomposed sebum. Either view admits the supposition that our patient had an unusual reaction of the skin secretion, a fact which would explain the comparative rarity of the discoloration.

After applying the cream to my own arm, I made it slightly alkaline with a weak solution of sodium bicarbonate, and it produced a black deposit. Likewise, when the cream was applied to wood and metal surfaces, it yielded the black deposit promptly. It is, of course, well known that mild mercurous chlorid preparations made alkaline rapidly change to the black mercuric oxid and mercury mixture, essentially the old-fashioned "black wash."

Quite as striking as the formation of a black deposit on alkalization was the rapid decoloration when the deposit was made mildly acid. A weak solution of acetic acid was used, and the decoloration which followed can readily be explained by the formation of mercuric acetate.

Thus far our last two experiments had suggested that a mercurial face cream in contact with an alkaline secretion or solution yields a blackish pigment of mercuric oxid and mercury, and that the reaction was apparently reversible by a dilute acid.

BEHAVIOR OF THE DISCOLORATION WHILE UNDER OBSERVATION

When the first patient (Case 1) was seen we did not know the chemical composition of the cream and for that reason we were not able to suggest a rational solvent for the deposit. Hydrogen peroxid was tried for its well-known bleaching properties, but it was without effect.

Three months after the patient's first visit, no appreciable change had occurred, although the use of the cream had been discontinued during this time. Meanwhile, the second patient had been examined, and the behavior of her face cream on alkalization and acidulation had been observed. As the latter cream contained mild mercurous chlorid only, it was assumed that this chemical alone was the offending agent. Therefore, both patients were advised to wash the discolored parts of the skin with a 2 per cent. aqueous solution of acetic acid twice daily. When the patient in Case 1 was seen after a second interval of three months the discoloration had grown materially lighter but was still plainly visible. At that time it was decided to use a 1 per cent. aqueous solution of potassium cyanid instead of the acetic acid solution, because of the well-known ability of the former to form water-soluble double salts with some of the heavy metals, including mercury. Three months after this suggestion had been put into effect, the patient said that the discoloration was constantly growing lighter but had not yet entirely disappeared.

The patient in Case 2 also used the cyanid solution following a trial of the acetic acid solution. She left our observation after about six weeks. The pigmentation was then definitely lighter in color. It should be mentioned that the acetic acid and potassium cyanid solutions used were found to be somewhat irritating to the skin. Solutions of half the strength would probably have answered the purpose.

It is not especially surprising that the pigmentation should be persistent even when proper solvents are applied. Careful inspection disclosed that the deposit was actually within the gland ducts and therefore relatively inaccessible to a solvent.

3. Zuntz, N., and Loewy, A.: Lehrbuch der Physiologie des Menschen, Leipzig, Vogel, 1920, p. 165.
4. Landois, L.: A Text-Book of Human Physiology, Philadelphia, P. Blakiston's Son and Company, 1891, p. 567.

COMMENT

After finding mercury in both cosmetic creams, I inquired somewhat more closely into the composition of such creams and found that mercury compounds are freely used in the preparation. The mercuric acid nitrate and chlorid, but chiefly mild mercurous chlorid, are favorite ingredients. The most plausible explanation of the apparent rarity of the discoloration described seems to be that the skin secretions of our two patients present peculiar properties. According to physiologists, an alkaline skin secretion is rare. The alkalinity of the sweat of one of our patients to litmus may explain the occurrence of this type of discoloration. Another explanation of the apparent rarity of the discoloration may be the fact that a woman thus predisposed would discard a mercurial cream at the first sign of darkening of the skin. It must certainly be unusual for a woman who gives the closest attention to her complexion not to suspect her face cream after many years' use of it. Prolonged application of mercurial preparations may be necessary to effect this typical pigmentation, and the practice of changing the brand of face cream frequently may explain the rarity of the trouble. It is quite possible too that the milder grades of discoloration have simply been overlooked.

A final statement as to the exact chemistry involved is probably not justifiable. A number of interesting speculations, however, present themselves. The fact that the mild mercurous chlorid in the face cream so promptly gave a black deposit on alkalization would make me suspect that mercuric oxid is formed, which later deposits metallic mercury. The deposit of metallic mercury in a finely divided state may account for the persistent discoloration of the glandular openings. Again, the possibility of unusual bacterial activity on the skin of these patients must not be overlooked.

CONCLUSIONS

1. Mild mercurous chlorid and possibly other mercurial salts may produce a peculiar type of discoloration when persistently applied to the unbroken skin of certain persons. In our patients, the mercurial salt was contained in proprietary face creams.

2. The discoloration may prove a source of considerable diagnostic difficulty even to experts and of much worry to the patient.

3. The pigmentation is probably dependent on some peculiar personal characteristic of the skin secretion. My experiments suggest that a mild alkalinity of the secretion may be the deciding factor.

4. Potassium cyanid in from 0.5 to 1 per cent. aqueous solution is probably the best solvent for the pigmented deposit.

ABSTRACT OF DISCUSSION

DR. F. J. EICHENLAUB, Washington, D. C.: I am not quite clear from Dr. Goeckermann's description as to whether we are dealing with a pigment or a discoloring chemical compound in the skin, and I should like to have him clear up this point. It makes a big difference whether it is simply a pigment or whether it is a mercurial salt or metal deposit.

DR. RICHARD L. SUTTON, Kansas City, Mo.: Owing to the comparative rarity of this condition, and the frequent use of mercurial preparations in "bleaching" powders and "freckle creams," I believe that the process is a more complicated one than the simple precipitation or formation of mercurous oxid. We have all encountered cases in which contact with the skin of certain persons turned gold jewelry brown or black, possibly as a result of the excretion of sulphur or of sulphurous acid gas. It is possible that the exhalations or excretions of this material might react on mercurial preparations, with ensuing formation of mercury sulphid in the mouths of the sebaceous and coil gland ducts.

DR. J. M. KING, Nashville, Tenn.: Dr. Sutton has expressed my opinion, and it seems to me that as this discoloration comes on the neck it is due to the preparation, the discoloration being due probably to the sulphur compounds secreted by the sweat glands or sebaceous glands, forming a black sulphid.

DR. ERNEST D. CHIPMAN, San Francisco: I recall one patient who had several pigmented areas on the face which, to my surprise, were entirely removed simply by the application of alcohol. Doubtless some precipitate, resulting from the promiscuous use of cosmetics, had formed in the skin. This, being soluble in alcohol, was removable.

DR. ERWIN P. ZEISLER, Chicago: It might be interesting to recall that lead can be absorbed through the skin in sufficient quantity to cause toxic symptoms. Two fatal cases have been reported of lead poisoning from face creams.

DR. W. H. GOECKERMANN, Rochester, Minn.: As to the rarity of this condition, I am not sure that it is so rare. Since preparing this paper I have seen another patient of the same type, and that makes three in a year. Prior to that I had not seen this pigmentation. As to whether it is a deposit or a discoloration, I do believe that there is a certain amount of chemical deposited in the stoma of the gland that produces the pigmentation. It seemed to me that it was a pigmentation, although I believe it was due to a chemical deposit, and so far as I was able to determine the form, it was a mercuric oxid and metallic mercury mixture rather than the sulphite of mercury.

BACILLUS ACIDOPHILUS

ITS VERY LIMITED VALUE IN INTESTINAL DISORDERS

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In recent years there has been a renewal of interest in the employment of *B. acidophilus* in intestinal toxemias. The organism was employed as far back as four years ago, at which time the fallacy of *Bacillus bulgaricus* cultures, *B. bulgaricus* milk and other preparations of *B. bulgaricus* as a therapeutic measure was becoming more and more generally recognized. Not a few of our best physicians advocated its use on the most cursory of clinical observation. No one seemed to take the trouble to investigate the therapy in any scientific way. The result of our observations in not being able on any plan of administration or quantities to recover them in the feces was soon reported to houses that sold it. Others did some detail work on it, and our observations were confirmed. The result of this was the thought to incorporate the organism (coat it, so to speak) by some substance insoluble in the intestinal canal. This was brought about by mixing pure cultures of the bacteria with a relatively soft paraffin about the consistency of petrolatum. The assumption was that in this way the organism would reach the colon in viable condition and exert its assumed benefits, as suggested by Metchnikoff. For a period this had its vogue in a proprietary suspension extensively sold, although the profession and the patient were more sold than the idea warranted. Request was made to us again to prove the value of this new product. As a result of several weeks of laboratory observation it was found that occasionally, and only very occasionally, could the organisms be recovered in the stool, and when

so, in only negligible quantities. The benefits claimed could have been as readily brought about by the paraffin alone, which, if taken in the same quantity, would have cost the patient much less than the proprietary lactic acid ferment preparation containing paraffin, and both the profession and the patient would not have been misled with false beliefs. The popularity of this form of administration had to have its fling, which continued until some one began to reason about as follows.

B. acidophilus is a normal denizen of the intestinal canal of man. In breast-fed infants, with *B. bifidus*, it represents the predominant bacteria in stools of the infants, and *B. coli* does not occur excepting in those infants who are artificially fed. Since breast feeding is the normal feeding for an infant, and many of them do better on it than when artificially fed, *B. acidophilus* must be a "good organism" to have in the intestinal canal. The assumption then happened that, when present in large quantities, it inhibited the growth of *B. coli;* and, since *B. coli* is commonly found in infections, *B. coli* must be pyogenic in nature. This was added to by the writings of several men who claimed much benefit by their use in a subcutaneous vaccine way. Although this had never been proved so far as the intestinal contents were concerned, and the scientific and clinical evidence is all the other way from Herter's time to the present, it was a "short cut" that the less serious student of medicine would take *per fas et nefas,* though it was well proved and understood that in putrefaction *B. coli* alone could not initiate the process and could act only when the anaerobes had prepared the pabulum in the intestine for its action. Then came a period of lactose feedings in the adult, and reports of the benefits accrued; but no one undertook to prove that such benefits as came occurred because the lactose stimulated the growth of the acidophil bacteria (*B. acidophilus* and *B. bifidus*), and in that way changed the chemical reaction in the tract from alkaline to acid. Lastly, now we are in the fetish of the use of *B. acidophilus* to correct the intestinal biologic troubles of man, and a few prophetic words may not be amiss or untimely.

B. acidophilus possesses an advantage over *B. bulgaricus* in that its administration by mouth causes it to occur in large numbers in the feces. This takes approximately about four days, and lasts as long as the administration is kept up. This can be easily proved by a Gram-stained specimen of feces, and it can also be proved that a considerable proportion of those in the stool are possible of culturization. The specimen thus produced shows a diminution of the organisms of the *B. coli* class, but careful work will also prove that this is only apparent. *B. acidophilus,* being a gram-positive and large sized organism, is so prominent in the picture that the small sized *B. coli* looks diminished, and is not "reformed," as Gompertz puts it, or actually diminished as it is being assumed. Careful counting of *B. coli* in these specimens shows that this organism is there in the same numbers as before in a weighed unit of stool in the majority of instances; and, if it is not, all that is required after weeks of administration of *B. acidophilus,* is to stop its use for a few days, and the content and the relative picture of stained specimen is there as before as if no *B. acidophilus* had been taken. More than that, the anaerobic bacteria (the real offenders in the intestinal canal of man) have also not been reduced in their numbers during the administration of *B. acidophilus,* their potential activity has not been interfered with, and all that is required is for the reaction of the intestinal contents to be returned to neutral or alkaline, and *B. coli* is again active on the proteins that these anaerobes prepare for it.

Clinically, however, not a few patients with intestinal toxemia claim improvement on *B. acidophilus.* These cases, however, are not in the group of the more important saccharobutyric toxemias, which are acid conditions in the intestine due largely to the action of the anaerobes and in which the *B. coli* content is low and thus the putrefactive processes are inhibited by this active negotiation. In those instances of putrefactive processes, the intestinal chemistry is amphoteric or alkaline, and anything that will change this chemistry to acid would inhibit the extent of putrefaction that occurs. This occurs in the lower ileum, but more so in the colon, especially the right side, although it is active all the way to the rectum. Any benefits that may come from the administration of *B. acidophilus* are contingent on whether or not the case is of the putrefactive type (and not the fermentative), namely, one in which the biologic consequence from activity of bacteria in the intestinal canal is that of a lowering of the normal acidity of the intestinal contents. An acidity inhibits the putrefactive processes during the time the organisms are being supplied to the intestine, and, as stated before, is entirely a chemical process and in no sense a biologic one, either within the tract or generally in the body. In the putrefactive cases, however, no actual bacteriologic change beneficial to the host is brought about by effect on the anaerobes or the secondary putrefactive organisms of the gram-negative group. They are present as before, and with all the potencies in no way affected. All that is necessary to prove this is to stop the administration of *B. acidophilus,* and in a few days the stool bacterial picture is as before its use. No immunity, local or general, of the real offenders has been accomplished, and all that is accomplished is a camouflage of the intestinal toxemia for the time being. The same result can be accomplished just as well by the use of several teaspoonfuls of lactose taken during the day; for this simple procedure will stimulate an enhancement of growth of *B. acidophilus* resident in the intestinal canal of all human beings in only a slightly longer time, and at a cost that is far less to the patient.

21 West Seventy-Fourth Street.

How to Keep Well to a Hundred Years.—French exchanges comment on researches recently undertaken by Dr. M. Natier of Paris on the factors that conduce to longevity. Natier's experience has convinced him that, to be healthy and alert in mind, one must be gaining in weight up to the age of 20; from 20 to 30 one *can* be gaining in weight, but from 30 to 40 the weight must be stationary, and after 40 the weight should decline. It should keep declining until one is thin, if one wishes to live to an advanced age in good physical and mental condition. Fat after 30, says Natier, is a dead weight for the organism. Besides leanness and moderation in eating and drinking, continuous activity seems to be the one other indispensable factor for prolonging life. Organs that are not used atrophy and degenerate; hence moderate, regular use of all the functions is necessary to maintain the organic balance. Emotional strain wears out the tissues. We grow old faster by the medulla-sympathetic system than by the muscles or brain. In the *Gazette des hôpitaux* (**95**:697, 1922), a review of Natier's study of centenarians adds that he is a believer in the Guelpa treatment for autointoxication: a course of purging followed by fasting. The consequence is felt not only by the digestive apparatus but also in a rejuvenation of the tissues at large, by the destruction of used up cells and infiltrations of fat.

STUDIES ON THE THERAPEUTIC EFFECT OF BACILLUS ACIDOPHILUS MILK AND LACTOSE

PRELIMINARY COMMUNICATION *

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The investigations of Rettger and Cheplin [1] have shown that *B. acidophilus* actually accomplishes much that Metchnikoff expected of *B. bulgaricus*, which has failed to fulfil its promise. They have described the satisfactory treatment of chronic constipation and diarrhea with milk fermented by *B. acidophilus* reinforced with lactose.[2] It is well known that patients in institutions commonly suffer from chronic constipation. The present investigation, therefore, was undertaken, at Dr. G. H. Kirby's suggestion, in order to ascertain the benefits, if any, to be derived by psychotic patients from such treatment.[3] In a sense this represents one aspect of the major problem under consideration, namely, the relation of focal infection to the functional psychoses (which has been reported elsewhere [4]). Some of the methods employed at the New Jersey State Hospital at Trenton, N. J., for the determination and treatment of focal infections have been subjected by us to critical analysis,[4] and therefore the attempt was made to experiment with some measure which could be substituted for the major intestinal surgery there resorted to for the alleviation of chronic intestinal stasis.

Two groups of subjects were used, the first consisting of seven "controls," who were mentally normal, and the second group consisting of seven female patients classed as dementia praecox and manic-depressive. The procedure and technic followed were precisely as outlined by Rettger and Cheplin,[1] with one important difference, namely, that whole milk was used in the present instance instead of skimmed milk, and that the bacterial counts were made weekly by microscope with occasional platings on whey agar. The usual daily administration was 1,000 c.c. of *B. acidophilus* milk and 300 gm. of lactose, half the amount being taken between dinner and supper, and the remainder between supper and bedtime. This amount, however, was reduced as considered advisable, particularly in the controls. In general, to obtain the most palatable product, the milk was incubated at 35 C. for twenty hours. A fresh "resting" culture of the strain, kindly furnished us in pure culture by Dr. Leo F. Rettger, was used every two weeks.

The results obtained with treatment after about six weeks [5] are shown in Table 1, and are best discussed individually. Considering the first psychotic subject, it will be seen that for the two month period of observation preceding the administration of milk and lactose there were very few movements without enemas. However, within three days after treatment was commenced a normal daily evacuation was obtained. In this instance the daily administration of lactose was reduced from 300 gm. to 100 gm. owing to complaints of fulness in the abdomen. Patient 2 showed an equally satisfactory adjustment. Patient 3 presents virtually the same course except that the evacuations do not occur daily with the same regularity. The relief, however, from constipation in these cases is particularly noteworthy in view of the fact that there was no change in mode of life.

The diet remained the same, except for the fact that somewhat less was eaten at mealtime. It may be mentioned that the hospital diet is not high in animal protein. Patient 4 presents a similar picture, with perhaps more irregularity in bowel movement. Patient 5 showed the most immediate response, even to the extent of becoming diarrheal. The omission of lactose soon resulted in a more normal condition. Unfortunately, both Patients 4 and 5 became so agitated as to make continuation of treatment impracticable. Patient 6 showed little change in condition, having about one normal defecation a week, despite the increase to 1,500 c.c. of milk administered daily. This patient took almost no other food, which may in part account for the difficulty.[6] Furthermore, there appeared to be considerable voluntary inhibition to defecation at all times. Patient 7 had daily bowel movements before treatment, but these were not of a very satisfactory nature. The addition of only 250 c.c. of *B. acidophilus* milk increased the daily amount of feces and reduced their putrefactive character.

TABLE 1.—THERAPEUTIC EFFECT OF B. ACIDOPHILUS

Patient	Condition Before Treatment	Duration of Treatment	Result of Treatment
	Patients with Psychoses		
1.	Defecation usually obtained only by enemas	7 weeks	Daily defecation
2.	Defecation obtained only by enemas	1 week	Daily defecation
3.	Defecation obtained only by enemas	6 weeks	Daily defecation (some exceptions)
4.	Defecation obtained only by enemas	6 weeks	Daily defecation (few exceptions)
5.	Occasional defecation without enemas	1 week	Several defecations 6 days out of 8
6.	Defecation obtained only by enemas	7 weeks	One defecation a week
7.	Daily small putrefactive defecations	2 weeks	Daily large nonputrefactive defecation
	Normal Controls		
8.	Monthly diarrheal attack, interval constipation	6 months	No diarrhea; daily normal defecation
9.	Sporadic diarrhea	6 months	No diarrhea; daily small defecation
10.	Mild constipation	4 months	Daily defecation (some exceptions)
11.	Cathartics required twice weekly	2 months	Daily defecation
12.	Cathartic required every other night	6 weeks	Daily defecations
13.	Rectal operations; no normal defecation	9 days	No normal defecation
14.	Daily hard defecation; some gas	3 weeks	Daily soft defecation (no gas)

Turning now to the mentally normal subjects, the first two, Patients 8 and 9, had had, previous to treatment, severe diarrheal attacks; the former suffered these at the rate of about one a month, with an intervening period of constipation, while the latter was a prey to less frequent sporadic attacks. For the five months during which Patient 8 took 1,000 c.c. of

* From the bacteriologic and clinical departments, New York State Psychiatric Institute, Ward's Island.

1. Rettger, L. E., and Cheplin. H. A.: The Intestinal Flora, New Haven, Conn., Yale University Press.

2. Rettger, L. F., and Cheplin, H. A.: Bacillus Acidophilus and Its Therapeutic Application, Arch. Int. Med. **29**: 357-367 (May) 1922.

3. Cheplin, H. A., and Wiseman, J. I.: Observations on the Effect of B. Acidophilus upon Cases of Chronic Constipation, Boston M. & S. J. **185**: 627-630 (Nov. 24) 1921.

4. Kopeloff, Nicholas: Individual Variation as Influencing the Rehfuss Fractional Method of Gastric Analysis, J. A. M. A. **78**: 404-406 (Feb. 11) 1922; New York State Hosp. Quart., June, 1922. Kopeloff, Nicholas, and Cheney, C. O.: Studies in Focal Infection: Its Presence and Elimination in the Functional Psychoses, read before the American Psychiatric Association, Quebec, Canada, June 8, 1922.

5. Kopeloff, Nicholas, and Cheney, C. O.: The Therapeutic Effect of Bacillus Acidophilus Milk and Lactose, Proc. Soc. Exper. Biol. & Med. **19**: 372 (May 17) 1922.

6. She has since obtained a normal daily defecation.

B. acidophilus milk and 100 gm. of lactose daily, and Patient 9 took 700 c.c. of *B. acidophilus* milk, neither experienced a diarrheal attack. In fact, Patient 8 had a perfect normal daily defecation (sometimes two), and this despite a rather high animal protein diet;[7] and Patient 9 had a daily movement which was usually not satisfactory in size. In the latter case it was not considered advisable to increase the amount of milk administered or to reinforce it with lactose, because this subject did not wish to gain weight. The next subject, Patient 10, might be considered as having a mild case of constipation, i. e., necessitating some form of treatment such as hot water or weekly laxative. She took only 500 c.c. of *B. acidophilus* milk daily; and, while the results were not striking, nevertheless a certain definite beneficial effect could be recorded. Patient 11 was interesting, as the use of laxatives was required about twice every week. Any ingestion of *B. acidophilus* milk brought an immediate response, and the chief difficulty was to find a minimal amount, since the milk acted as a purgative. Patient 12 had to use cathartics every other night. The administration of *B. acidophilus* milk and lactose caused satisfactory daily defecations. Patient 13, who had undergone rectal operations, took 1,000 c.c. of *B. acidophilus* milk and some lactose, but obtained no beneficial results in nine days. Three enemas and a cathartic were taken during this period. The patient preferred to discontinue the treatment. Patient 14 had had normal daily defecations, but on taking about 300 c.c. of *B. acidophilus* milk daily, the color and consistency of the feces were much improved.

TABLE 2.—RELATIVE PERCENTAGE OF GRAM-POSITIVE AND GRAM-NEGATIVE ORGANISMS IN FECES (WEEKLY SAMPLES)

	3/24*		3/27*		4/3		4/11		4/18		4/25		4/29		5/2		5/9	
Patient	+	−	+	−	+	−	+	−	+	−	+	−	+	−	+	−	+	−
1	33	67	21	79	21	79	68	32	46	54	50	50	39	61	36	64	40	60
3	30	70	16	84	25	75	47	53	41	59	70	30	..	..	25	75	24	76
4	19	81	15	85	16	84	65	35	66	34	25	75†	42	58	36	64	78	22
5	36	64	14	86	16	84	20	80†	..	..	..	..	..	..	..	..	..	..
6	37	63	24	76	18	82	40	60	40	60	44	56	38	62	38	62	30	70
7	..	..	..	..	..	..	..	..	..	..	..	..	..	..	58	42	64	36
8	..	..	74	26	..	..	63	37	..	..	..	..	..	..	..	..	..	..
9	..	..	49	51	28	72	..	..	..	..	38	62	..	..	..	..	..	..
10	..	..	62	38	..	..	..	..	..	..	..	..	..	..	..	..	..	..

* Before treatment. † Milk discontinued.

In general, then, it may be said that the subjects receiving *B. acidophilus* milk and lactose obtained relief from constipation and diarrhea. It is further interesting to note in this connection that even after discontinuing treatment, one (Patient 4) continued to have a daily defecation.

Considering now the changes in intestinal flora induced by the ingestion of *B. acidophilus* and lactose, the relative percentages of gram-positive and gram-negative organisms as present in the feces and examined weekly are shown in Table 2.

While the results are not very striking, nevertheless, it will be seen that in general there is a tendency toward an increase in the relative proportion of gram-positive organisms. The failure to obtain a greater ascendency of *B. acidophilus* in the intestinal flora of these patients may be due to the fact that the pabulum has been *whole* milk and not skimmed milk as employed by Rettger and Cheplin.[1] Obviously, the gram-negative bacteria have a more suitable opportunity for development in this medium.[8]

An interesting feature of this treatment is the accompanying gain in weight, in two psychotic patients and four controls, of about 3 to 5 pounds. While it might be expected that the daily ingestion of milk would bring about such results, nevertheless, in a majority of instances, there has been a corresponding reduction in food intake, which possibly argues a somewhat enhanced absorption of nutrients. The change in the character of the feces is also of considerable importance. Almost invariably the actual amount has increased, and the color has become considerably lighter, and the consistency softer. With the carmin test, before treatment, no carmin could be detected in the feces of three of the patients after forty-eight hours even with an enema; and three patients showed carmin from forty-eight to seventy-two hours after ingestion. After treatment the carmin was expelled in approximately one-half the time required before treatment.

Within the limitations of the data under consideration, it is evident that with the ingestion of *B. acidophilus* there is a change in the intestinal flora, as shown by Rettger and Cheplin,[1] and a relief from constipation and diarrhea. In other words, instead of major surgery for the alleviation of a condition concomitant with chronic constipation, *B. acidophilus* treatment might well be worth a trial. Next in importance to the actual relief from chronic constipation is its influence on the psychoses. So far, within this limited period of time, this appears to be negative.

Patients 1 and 2, each classified as a case of dementia praecox, evidenced no change in their mental reactions during the periods of treatment.

Patient 3, who had a recurrent depression, became somewhat brighter, less depressed and more communicative during the period of six weeks' treatment. However, she continued retarded in her activity as compared with her normal condition, and, on the whole the improvement was not striking.

Patient 4, a case of dementia praecox, with ideas of influence and poisoning, resisted taking the milk practically during the whole period of treatment; this resistance became greater, attempts to feed the milk by tube were unsuccessful because of vomiting, and the treatment was discontinued after six weeks. During and following the treatment, there was less complaint about her bowels not moving, and she was relieved of the pain and distress which had occurred when enemas were given; but otherwise there was no change in the clinical picture. She remained idle, and retained her previous ideas.

Patient 5 was at the time of the beginning of treatment showing a change from a depressed condition to a manic excitement. Her excitement during the week of treatment increased, she became entirely uncooperative, and it was necessary to discontinue the milk.

Patient 6, who had a recurrent depression, was mute and quite inactive in bed during the seven weeks' period of treatment. Toward the end of this period she appeared to become slightly more alert, at times showed evidence of cheerfulness, and spoke occasionally. Otherwise, there was no improvement.

Patient 7, who had had a recurrent manic excitement, was much improved at the time of beginning treatment, showing good self-control, and working industriously in the ward. It was not evident that, during the period of two weeks' treatment with *B. acidophilus* milk, there was any change in her clinical picture, except an increase in weight of 5 pounds.

7. Since discontinuing treatment, this subject has had two severe diarrheal attacks within six weeks.

8. By using skimmed milk we have since obtained fecal plates containing 100 per cent. *B. acidophilus* colonies from a psychotic patient.

During the foregoing investigation, certain points of interest arose, to which the following data refer. In the first place, it is of importance to determine the number of viable *B. acidophilus* organisms ingested daily. In Table 3 is shown the daily analysis of milk both as regards viable *B. acidophilus* and acidity. It will be observed that the usual daily inoculums contained in the neighborhood of 100,000,000 to 200,000,000 viable *B. acidophilus* organisms per cubic centimeter. On the basis of 1,000 c.c. administered, this would amount to an ingesiton of from 100,000,000,000 to 200,000,000,000 *B. acidophilus* organisms each day. The acidity of 10 c.c. of the milk was neutralized by about 18 c.c. of twentieth normal sodium hydroxid. Continued daily bacteriologic and clinical analyses over a period of about six weeks have approximated these figures.

In Table 4 are shown some results in plating fecal suspensions on whey agar. The figures represent the averages of duplicate plates in two dilutions. It will be seen that the relative proportion of gram-positive to gram-negative bacteria is even lower than shown by

TABLE 3.—DAILY ANALYSIS OF B. ACIDOPHILUS MILK ADMINISTERED

Date	Age of Transfer, Days	Incubation of Milk, Hours	Acidity, C.c. N/10 NaOH for 10 C.c. Milk	B. Acidophilus Organisms, No. per C.c.
4/19	5	..	....	240,000,000
4/20	6	22	....	240,000,000
4/21	7	21	....	190,000,000
4/22	8	19	....	260,000,000
4/24	10	20	....	430,000,000
4/25	11	20	24.1	200,000,000
4/26	12	21	....	300,000,000
4/27	13	21	21.8	130,000,000
4/28	14	23	20.2	135,000,000
4/29	15	19	16.3	210,000,000
4/30	16	17	15.4	22,000,000
5/ 1	17	22	18.4	Lost
5/ 2	1	23	5.4	3,500,000
5/ 3	2	22	16.8	27,000,000
5/ 4	3	21	10.7	30,000,000
5/ 5	4	24	13.1	90,000,000
5/ 6	5	19	12.8	1,500,000
5/ 7	6	18	17.1	145,000,000
5/ 8	7	22	15.9	64,000,000
5/ 9	8	24	23.4	70,000,000
5/10	9	25	18.2	75,000,000
5/11	10	22	16.4	140,000,000
5/12	11	24	14.5	135,000,000

microscopic count. However, the last column is of immediate concern. The calculation of the percentage of ingested *B. acidophilus* organisms in the feces was made as follows: The subjects received 1,000 c.c. of milk containing approximately 200 million *B. acidophilus* organisms per cubic centimeter, or a total of 200,000,000,000. A fair daily amount of feces would be about 100 gm. One hundred times the number of viable *B. acidophilus* organisms found per gram divided by 200,000,000,000 would yield the percentage of viable *B. acidophilus* organisms ingested, as excreted in the feces. These percentages are very small, and might create some doubt as to whether any actual multiplication of *B. acidophilus* occurs in the intestine.

In order to determine the keeping qualities of *B. acidophilus* milk, a series of three flasks was inoculated and incubated at 35 C. for twenty-four hours, and thereafter incubated for two weeks at room temperature (from 25 to 30 C.). They were analyzed daily for acidity and plated in duplicate in two dilutions for numbers of viable *B. acidophilus* organisms.

In Table 5 are presented the averages for the three flasks, the last column indicating the probable error as calculated in the usual way. It will be seen that the numbers of viable organisms decline quite rapidly after three days, and then maintain a fairly low level. Also there was a marked rise in acidity after the first few days, and the milk consequently became less palatable. At the end of two weeks the taste was very unpleasant. This experiment was repeated twice again with similar results.

The studies here reported, in which we were materially assisted by the members of the staff and particularly by Mr. E. J. Kennedy, Mr. Philip Beer-

TABLE 4.—GRAM-POSITIVE VERSUS GRAM-NEGATIVE BACTERIA IN FECAL SUSPENSIONS (PLATED ON WHEY AGAR)

Patient	Date	Gram-Positive, Millions per Gm.	Gram-Negative, Millions per Gm.	Ingested B. Acidophilus Organisms Found Viable in Feces, per Cent.
1.....	4/29	18	40	0.90
3.....	4/25	5	13	0.25
4.....	4/28	9	39	0.45
6.....	4/28	1	31	0.05

man and Miss A. Feeney, charge nurse, represent only a preliminary portion of the investigations in progress along these lines.

SUMMARY

Subject to the limitations of the material under consideration, the following points have been established:

1. Relief from chronic constipation and diarrhea has been secured by the ingestion of *B. acidophilus* milk and lactose in mentally normal and psychotic subjects. This corroborates the work of Rettger and Cheplin.[1]

2. Five psychotic patients receiving such treatment showed no improvement in their mental conditions during the period of treatment; in two others improvement was slight, but was not more than might have been expected without treatment with *B. acidophilus* milk, each of these patients having recovered previously from similar attacks without this treatment.

3. The intestinal flora becomes changed on treatment with *B. acidophilus* whole milk and lactose, but the relative percentage of gram-positive rods rarely exceeds 70 per cent.

4. Incubating *B. acidophilus* whole milk at room temperature is satisfactory for three or four days,

TABLE 5.—AVERAGE OF DAILY ANALYSIS OF B. ACIDOPHILUS AT ROOM TEMPERATURE

Date	Age of Transfer, Days	Incubation of Milk, Hours	Acidity, C.c. N/20 NaOH for 10 C.c. Milk	B. Acidophilus Organisms, No. per C.c., Millions	Probable Error
4/27	1	30	22.4	177	± 2.4
4/28	2	25	18.8	184	±23.4
4/29	3	22	21.2	141	±17.4
4/30	4	23	22.9	44	±11.4
5/ 1	5	20	28.0	13	±11.4
5/ 2	6	20	29.6	30	± 3.6
5/ 3	7	24	34.9	12	± 1.2
5/ 4	8	23	33.0	9	± 1.4
5/ 5	9	25	36.9	19	± 1.8
5/ 6	10	25	38.2	20	± 4.2
5/ 7	11	21	39.0	25	± 0.7
5/ 8	12	23	40.0	2.5	± 0.7

after which the number of viable organisms decreases rather rapidly, and the acidity increases to the point of unpalatability.

Distomatosis in El Salvador.—J. Soto describes with illustrations in *La Clinica* **1**:170, 1922, the first case of distomatosis encountered in El Salvador. The patient died so suddenly that his skull was fractured as he fell. A crime was suspected until necropsy revealed over 300 specimens of *Clonorchis sinensis.*

ACUTE DILATATION OF THE STOMACH *

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The etiology and pathogenesis of acute dilatation of the stomach and its attendant phenomena are for the most part obscure. A considerable number of exhaustive clinical and pathologic studies of this interesting and important phase of gastric pathology have appeared in recent years, notably those of Conner,[1] Borchgrevink [2] and Novak.[3] A careful scrutiny of reported cases seems to have definitely established a number of significant points. Following the example of Conner, it has been customary to classify the cases on the basis of a chief pathologic factor common to certain groups, and it was found that many followed operations under general anesthesia, which was usually chloroform. Others developed during the course of, or convalescence from, severe and wasting diseases, after injuries, after errors in diet associated with sudden overloading of the stomach, and in persons with spinal deformities of various kinds. To these groups probably should be added those cases of acute postpartum dilatation of the stomach which are reported with increasing frequency in obstetric literature. As emphasized by Doolin,[4] if the pathologist has this condition in mind, at the necropsy a dilated stomach and a duodenum partly or completely obstructed are the chief anatomic findings. The unsettled questions are the relations which these conditions bear to one another, their etiology and pathogenesis, and their relation to the other phenomena of the disease, namely, the enormous accumulation of secretions in the stomach, the dehydration, the collapse, and death.

ETIOLOGY AND MECHANISM OF ACUTE DILATATION OF THE STOMACH

The occurrence of acute gastric dilatation during the course of an abdominal operation indicates that the mechanism is probably a nervous reflex. The recent experiments of Carlson and Luckhardt[5] demonstrate that it is possible to obtain both somatic and visceral reflexes from the stimulation of either somatic or visceral sensory nerves. Relaxation of the stomach has been observed following direct stimulation of the peripheral splanchnic nerves or reflexly through stimulation of many of the abdominal viscera. Although the operation has been performed a great number of times in the study of various problems, a section of both vagus nerves above the diaphragm, or a combined section of both vagus nerves and splanchnic nerves in dogs has never in our experience produced a dilated stomach with adverse symptoms. The work of Carlson, Luckhardt, Alvarez and others indicates that the alimentary tract possesses a peripheral automatic mechanism similar to that of the heart or amphibian lung, and a section of its extrinsic nerves does not produce gastric paralysis any more than section of the vagus or sympathetic branches to the heart results in paralysis of the cardiac musculature. There is direct experimental evidence as well as clinical observation that ether or chloroform anesthesia depresses the gastric tonus, and this no doubt may be a contributory factor in many cases. It is not probable that the absorption of toxic materials from the occluded upper intestinal tract or duodenum plays an important rôle in the gastric dilatation, since this was never observed in animals in which a toxemia similar to that of high obstruction was induced by the production of closed intestinal loops.[6] In these experiments the effect of the poisons could be observed independently and free from any mechanical distention produced by retained contents. When injected intravenously, these toxic materials produced marked motor activity of the entire gastro-intestinal tract; but a depression or paralysis was never observed. It can be easily demonstrated experimentally that a stenosis of the duodenum will result in a gradual dilatation and hypertrophy of the part above the obstruction and the stomach. An acute dilatation of the stomach is rarely, if ever, produced by such a stenosis.

RELATION OF DILATED STOMACH AND OBSTRUCTED DUODENUM TO COLLAPSE AND DEATH

It is quite improbable that the dilatation of the stomach is responsible directly for the protean symptoms that accompany the condition. When such an acute dilatation has occurred on the operating table and been relieved by the introduction of a stomach tube, the immediate reflex disturbances are slight and are not characteristic. A distention of the stomach of a dog under ether anesthesia, after ligation of the cardia and pylorus, gave rise to temporary reflex effects on distant organs; but the condition of the animal was not bad, and complete recovery took place when the ligatures were loosened and the air released. A distention of the stomach of both anesthetized and unanesthetized dogs with rubber balloons never produced acute dilatation, although the pressure was raised sufficiently to cause vomiting movements.

The symptoms, such as vomiting, thirst, scanty urine, and rapid collapse, which often make it difficult to distinguish the condition from perforative peritonitis or intestinal obstruction, are those of a severe toxemia rather than the result of reflex or mechanical effects from the stretched and dilated stomach. The view of Rokitansky, Albrecht, Conner and others places the essential pathologic condition not in the stomach but in the obstruction to the third portion of the duodenum. The mechanism of this obstruction by the mesentery and some experimental data illustrating factors which may bring it about are given by various writers.[7] The explanation given by Borchgrevink that there occurs a primary gastric dilatation and secondary mechanical occlusion of the duodenum, either by the direct pressure of the stomach on the duodenum in its passage over the spine or by a secondary arteriomesenteric compression brought about by the downward pressure of the dilated stomach which forces the small intestine into the

* From the Hull Physiological Laboratories of the University of Chicago and the Department of Surgery of Rush Medical College.

* Read before the Section on Pathology and Physiology at the Seventy-Third Annual Session of the American Medical Association, St. Louis, May, 1922.

1. Conner, L. A.: Acute Dilatation of Stomach and Its Relation to Mesenteric Obstruction of the Duodenum, Am. J. M. Sc. **133**: 245, 1907.
2. Borchgrevink, O. J.: Acute Dilatation of the Stomach and Its Treatment, Surg., Gynec. & Obst. **16**: 662, 1913.
3. Novak, Emil: Acute Postoperative Dilatation of the Stomach, J. A. M. A. **77**: 81 (July 9) 1921.
4. Doolin, W.: Acute Dilatation of the Stomach, Brit. J. Surg. **6**: 125 (July) 1918.
5. Carlson, A. J., and Luckhardt, A. B.: Vagus Control of the Esophagus, Am. J. Physiol. **57**: 299 (Sept.) 1921.
6. Dragstedt, L. R.; Moorhead, J. J., and Burcky, F. W.: Intestinal Obstruction, J. Exper. Med. **25**: 421 (March) 1917. Dragstedt, L. R.; Dragstedt, C. A.; McClintock, J. T., and Chase, C. S.: Ibid. **30**: 109 (Aug.) 1919.
7. Albrecht, P. O.: Ueber arteriomesenterialen Darmverschluss an der Duodenojejunalgrenze und seine ursachliche Beziehung zur Magenerweiterung, Virchows Arch. f. Path. Anat. **156**: 285, 1899. Rokitansky: Lehrbuch der pathologischen Anatomie **3**, 1863.

pelvis, is supported by these experiments. There is no conclusive evidence that an arteriomesenteric occlusion of the duodenum as a result of a long and dependent mesentery can ever cause a dilatation of the stomach, although, as will be seen, it may cause a severe toxemia.

During the course of an experimental study of acute intestinal obstruction, certain facts were forced to our attention which have great significance for the present problem. In those experiments it was demonstrated that the toxic materials, which in the event of an acute high obstruction entered the blood stream and caused

TABLE 1.—ANALYSIS OF GASTRIC CONTENT IN CASES OF ACUTE POSTOPERATIVE DILATATION OF STOMACH *

No.	Operation	Anesthetic	Onset	Gastric Contents: Free HCl	Gastric Contents: Total HCl	Gastric Contents: Bile	Gastric Contents: Blood
1	Inguinal hernia	Gas-ether	48 hrs.	+	+	+	+
2	Kidney stone	Ether	36 hrs.	No examination			
3	Mesenteric fibroma	Gas-ether	48 hrs.	0	0	+	0
4	Prostatectomy	Ether	48 hrs.	0	0	+	0
5	Cholecystectomy	Ether	24 hrs.	0	0	+	0
6	Resection of stomach	Ether	120 hrs.	0	0	+	0
7	Appendectomy	Ether	48 hrs.	0	0	+	0
8	Gastro-enterostomy	Ether	36 hrs.	0	0	+	+

* From records of the Presbyterian Hospital of Chicago.

a sudden and fatal toxemia, had their origin in the intestinal tract as a result of the activity of proteolytic intestinal bacteria. Of even more importance, however, than the presence of these toxic bodies in the intestine are the factors which permit their absorption. They are not absorbed through a normal intestinal mucosa, but are absorbed when the blood supply to the intestinal wall has been disturbed by great distention. Organs, such as the colon or stomach, which have in part a storage function are capable of very great distention without injury by reason of the arrangement of their blood supply. On the other hand, the small intestine, especially the duodenum, is capable of practically no dilatation. By reason of its investment in a tough, fibrous envelop and the position of its nutrient vessels, which are arranged parallel to its long axis, any distention of the duodenum must result in an immediate circulatory damage. Irrespective of whether the mesenteric obstruction of the duodenum be due to a downward drag of the small intestines in the pelvis or be secondary to a dilatation of the stomach which forces the intestines down, it is obvious that the obstruction to the duodenum cannot be very great. This is confirmed by postmortem observations, in which it is usually found that the obstruction can be easily overcome by the examiner's finger, a fact which has led many to question the importance of the duodenal obstruction in the pathogenesis.

In a study of some of the functions of the duodenum,[8] it was necessary to produce duodenal fistulas of various kinds for the collection of secretions. The pylorus was closed, a gastrojejunostomy performed, and the lower end of the isolated duodenum brought to the surface through the rectus abdominis muscle. Although a similar type of fistula in the jejunum, ileum or colon was found to be without harm, most of the animals with duodenal fistulas died very promptly, often within forty-eight hours. The symptoms were those of a severe toxemia, with vomiting and rapid collapse. Similar observations had been made before by Matthews and Pilcher,[9] and by Whipple.[10] At the necropsy, the isolated duodenum was usually slightly distended, but otherwise normal. Apparently the abdominal muscles had acted as a sphincter and prevented the free escape of the duodenal secretions. In later experiments, care was taken to prevent this type of obstruction by placing a rubber catheter in the duodenum and washing it daily. When this was done, no adverse symptoms appeared, and animals could survive for long periods with such duodenal fistulas.

These observations, which demonstrated that a slight obstruction, of a degree which would have no effect in the small intestine or colon, would in the duodenum result fatally, suggested the following type of experiment: Obstructions of varying degrees were produced in the lower duodenum by means of light rubber bands. In two experiments, an ordinary rubber band about 1.5 cm. wide was placed around the duodenum, drawn barely tight enough to collapse the intestine and close its lumen, and stitched in place. In three experiments a still slighter obstruction was secured by using a band made of thin condom rubber, 2 cm. wide, again drawn just tight enough to collapse the intestine. Four of the animals died promptly within seventy-two hours with the usual symptoms of acute high obstruction. At the necropsy, the duodenum above the occluded area in each case was slightly distended, but the stomach was firmly contracted, especially in the pyloric region. In each case the degree of obstruction caused by the rubber band was very slight, and could be easily forced by the examiner's finger. In two cases the obstruction was forced by a column of water 6 inches high. An obstruction of this degree does not produce any symptoms whatever if it is produced in the lower jejunum, ileum or colon.

The facts developed from animal experimentation indicate that a severe or fatal toxemia could quite easily arise in man from an arteriomesenteric obstruction to the duodenum; but when this is a primary factor there is no evidence to indicate that dilatation of the stomach would probably follow. Such an occlusion has never produced an acute dilatation in the dog. It is probable that the dilatation is the primary factor, but that the toxic symptoms are dependent on the secondary duodenal occlusion. It is not unreasonable to suppose that the clinical symptoms of uncomplicated duodenal stenosis and duodenal stenosis plus a dilatation of the stomach should be somewhat different, although the origin of the toxemia is the same in the two cases. It is not probable that the source of the toxemia is absorption from the dilated stamach. In all of our experi-

TABLE 2.—EFFECT OF INTRAVENOUS INJECTION OF TOXIC SUBSTANCES OBTAINED FROM THE DUODENUM ON THE SECRETION OF DIGESTIVE JUICES IN THE DOG

Procedure	Gastric Secretion: Volume, C.c.	Gastric Secretion: Free Acid	Gastric Secretion: Total Acid, Units	Duodenal Juice, Drops	Pancreatic Juice, Drops	Bile, Drops
Normal rate of secretion 30 min.	3	0	4	53	52	22
Normal rate of secretion 30 min.	3	0	4	59	56	30
Intravenous injection of toxic substances from duodenum:						
1st 30 min. period	3	0	8	100	70	40
2d 30 min. period	3	0	8	135	50	58
3d 30 min. period	5	0	7	75	21	39
4th 30 min. period	5	0	7	82	20	25

8. Dragstedt, L. R.; Dragstedt, C. A.; McClintock, J. T., and Chase, C. S.: Extirpation of the Duodenum, Am. J. Physiol. **46**: 584 (Aug.) 1918.

9. Matthews, A. P.: Physiological Chemistry, New York, 1915, p. 388.
10. Whipple, G. H.: J. Exper. Med. **15**: 259, 1912. Whipple, G. H.; Stone, H. B., and Bernheim, B. M.: Ibid. **17**: 286, 307, 1913; **19**: 144, 166, 1914.

ments it was noted that toxemia usually occurs within a few hours after distention of a closed loop and interference with its blood supply. In gastrectasis following surgical operations, however, the toxic symptoms are usually delayed two or three days until a time when the duodenal occlusion could have developed, and a distention could have taken place. It is difficult to see how a dilatation of the stomach of reflex origin could take place two or three days after the inciting trauma of the operation. It is more probable that the dilatation is immediate but unrecognized until the secondary duodenal occlusion has produced the toxic symptoms.

ORIGIN AND NATURE OF VOMITED FLUID

One of the most striking features of the disease is the enormous quantity of fluid which is regurgitated or may be aspirated from the dilated stomach. This is far in excess of the fluid intake, and the excessive thirst and scanty urine testify to the dehydration produced. Many observers have noted the rapid filling of the stomach after it has been completely emptied by a stomach tube. In most cases in which examination was made, the fluid contained little or no free hydrochloric acid, and practically always contained bile, as shown in the accompanying table. A study of these cases suggests that the fluid is made up of not only gastric juice but also bile, pancreatic juice, and perhaps the duodenal secretion as well. It is quite evident that the great amount of fluid present cannot be the normal output of the glands in question, but must represent the result of a profound stimulation. The mechanism of this secretion has not been adequately studied. Although a part of the normal gastric secretion is dependent on reflex stimulation of secretory fibers in the vagus nerves, it is not probable that nervous influences play any significant part in the production of this fluid. Most of the evidence indicates a depression rather than an increased vagus tonus. The previous studies, which suggest so strongly the simultaneous presence of a duodenal occlusion of a degree sufficient to cause a severe toxemia or death, if unrelieved, afford a clue to the nature of the stimulus. It is known that the toxemia of acute high intestinal obstruction is accompanied by the secretion of great quantities of fluids into the stomach and intestine above the obstructed area. A study of the physiologic activity of the poisons of acute obstruction has demonstrated that these are very active secretagogues, and it is quite probable that some of them are identical with the so-called secretion bodies which may be obtained from the duodenal mucosa and which have such a striking effect on the secretion of gastric and pancreatic juice. Animals were prepared for the experiments in the manner suggested by Luckhardt, Palmer and Henn,[11] which permits of the simultaneous collection of the secretions of the stomach, the bile, the pancreatic juice and the duodenal secretion from animals in comparatively good physiologic condition. Sublethal doses of fluid obtained from an obstructed duodenum or closed intestinal loop, when injected intravenously into such animals, were found to produce a striking increase in all of the secretions. The fluid expelled from the stomach in acute high obstruction or acute dilatation of the stomach is doubtless made up of the greatly augmented products of all of these glands and the stimuli to its production are chemical rather than nervous reflexes. It should be noted that in both of these conditions the excessive secretion may result in considerable dehydration. The dehydration is, however, produced by the entrance of these toxic substances with their secretagogue action into the blood stream, and cannot be considered a primary factor in any sense.

11. Luckhardt, A. B.; Palmer, W. L., and Henn, S. C.: On the Specificity of Gastrin and Pancreatic Secretin, Am. J. Physiol., to be published.

RELATION OF ACUTE DILATATION OF STOMACH TO TETANY

Tetany is a symptom not uncommonly associated with gastro-intestinal disturbances, and is notably frequent in acute dilatation of the stomach. Heretofore the common explanation has ascribed these manifestations as of reflex origin from the irritated intestine or the distended stomach. In a series of experiments reported elsewhere,[12] we have demonstrated that the tetany which appears in animals following removal of the parathyroid glands is dependent on the absorption of toxic substances from the intestinal tract. These substances, in common with those which are responsible for the toxic symptoms in acute dilatation of the stomach, are produced in the lumen of the intestinal tract by the activity of the proteolytic group of intestinal bacteria. They are not true bacterial toxins, but represent various toxic protein fractions arising from the partial splitting of the protein molecule by the bacterial enzymes. A practically complete removal of the proteolytic bacteria from the intestine or a change in their metabolic processes may be secured in animals by feeding a carbohydrate diet which contains definite amounts of either lactose or dextrin. There is definite experimental evidence that these changes in the intestinal flora reduce the toxicity of the intestinal content.[13] When the parathyroid glands are removed from such animals, tetany does not appear, and the animals may survive indefinitely. A natural inference is that the parathyroid glands in some way exert a detoxifying function particularly concerned with these intestinal poisons, which apparently find their way into the systemic blood stream in appreciable quantities. A parathyroid deficiency or complete absence would permit their accumulation in the body in sufficient concentration to produce the tetany. In acute dilatation of the stomach, it is probable that the tetany is due to the excessive absorption of these intestinal poisons beyond the ability of the parathyroids to care for them, or there may have been a preexisting parathyroid deficiency so that its factor of safety was easily overcome.

MECHANISM OF CURE BY POSTURAL TREATMENT AND GASTRIC LAVAGE

It has been definitely established that the excessive mortality formerly associated with acute gastric dilatation may be greatly reduced by the prompt use of the stomach tube and the adoption of the postural treatment advocated by Schnitzler. These cases are apparently so striking that any accurate explanation of the pathogenesis of the disease must afford a rational explanation of the beneficial results from such treatment. The frequent use of the stomach tube removes from the stomach and distended duodenum the toxic materials whose absorption is responsible for the toxemia, and also lessens the occlusion to the duodenum produced by the weight of the stomach. The adoption of the knee chest position or the prone position with elevation of the pelvis affords relief, and the explanation is undoubtedly that given by those who first advocated it;

12. Dragstedt, L. R.: Pathogenesis of Parathyroid Tetany, read before the Society for the Study of Internal Secretions, St. Louis, May, 1922.

namely, it releases the mesenteric occlusion of the duodenum by removing the downward traction of the mesentery and the weight of the dilated stomach. We should expect that it would be more efficacious than the gastric lavage, since experimentally it was found that the factors which permit of the absorption of intestinal poisons, i. e., obstruction with distention, are far more important than the production of these poisons. This type of toxemia in dogs can be successfully controlled by the frequent administration of large amounts of Ringer's solution or salt solution intravenously or by hypodermoclysis. There is no reason why such treatment may not be tried in clinical cases.

ABSTRACT OF DISCUSSION

DR. JAMES J. MOORHEAD, Terre Haute, Ind.: Speaking of acute dilatation of the stomach from the clinical standpoint, I recently had this rather unusual experience: A patient was admitted to the hospital suffering from a gunshot wound of the lower abdomen received thirteen hours previously. An enormous distention of the stomach was relieved by the use of a tube, and the patient was prepared for laparotomy. During the intra-abdominal work—six perforations of the small intestine were closed—a recurrence of the gastric dilatation subsided following the treatment employed in the first instance. Dr. Dragstedt's paper emphasizes the value of animal experimentation in the solution of clinical problems.

DR. JOHN J. GILBRIDE, Philadelphia: I was interested to hear from the pathologist as to his views on the etiology of acute dilatation of the stomach. My acquaintance with the subject was made in 1901 when I came across a little booklet of lectures on "Tumors of the Stomach," by the late Sir William Osler, which he delivered at Johns Hopkins Hospital. There is shown a plate of a necropsy in which the abdomen is opened and in which an acutely dilated stomach practically fills the entire abdomen. Acute dilatation of the stomach occurs most frequently after operations on the upper abdomen. However, it may occur after operation on any part of the body. It has occurred after operation on the head, and it has also occurred after the application of a cast or other apparatus for a support in disease of the spine. Both the motor and secretory functions of the stomach are profoundly affected. The stomach becomes hugely and rapidly dilated. There appears to be a profuse secretion into the stomach. This comes mostly from the stomach, and it is probably augmented by secretions from the pancreas and the liver. It appears to me that obstruction as an etiologic factor does not explain the condition. Personally, I believe that the statements made about compression of the duodenum by the superior mesenteric vessels are more mythologic than real. Gastro-enterostomy does not accomplish anything in these cases. Paterson had acute dilatation of the stomach occurring in two cases in which he had performed gastro-enterostomy for ulcer.

DR. A. J. CARLSON, Chicago: This work seems to link several known facts, particularly in connection with intestinal obstruction and intestinal intoxication, so that the interpretation offered must be refuted by something more substantial than mere guess. The work suggests a more rational therapy of that condition than gastro-enterostomy, because gastro-enterostomy would not necessarily relieve an obstructed duodenum. Dr. McKenna suggested some years ago the production of a fistula in the duodenum for the relief of general peritonitis, on the theory that some of the symptoms of general peritonitis involve interference with the duodenal functioning (obstruction). Would it not be feasible to introduce a duodenal tube for drainage of the obstructed duodenum via the mouth? This should be superior to the duodenal fistula operation for an obstructed duodenum, as this operation at times induces a more severe obstruction than the one we attempt to relieve by it.

DR. LESTER R. DRAGSTEDT, Chicago: We have never produced acute dilatation of the stomach in an experimental animal. A toxemia of high intestinal origin will cause death with practically all of the symptoms of acute dilatation of the stomach. There is no experimental evidence that dilatation or distention of the stomach will reflexly produce the symptoms we see in this condition. The beneficial effects of the adoption of the prone position with elevation of the pelvis and the use of the stomach tube can really be explained on the basis of the pathogenesis of the disease presented. The dehydration must be regarded as a result of the profuse secretion into the upper intestine and stomach, brought about by the toxic secretagogues and cannot be considered a primary factor. It would be relieved by the intravenous or hypodermic administration of Ringer's solution, which in addition would dilute and promote the excretion of toxic materials in the blood.

CONTRIBUTIONS TO THE PHARMACOLOGY AND THERAPEUTICS OF IODIDS *

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I shall present here a summary of the results of certain studies of the pharmacology and therapeutics of iodids carried on in the Section on Dermatology and Syphilology of the Mayo Clinic during the last two years. Detailed accounts of methods and data covering each phase of the work will be published later.

Throughout these studies the method of Kendall [1] for the determination of iodin has been scrupulously followed. The advantages of this method are numerous, chief among which are its delicacy and accuracy with minute amounts of iodin, and, therefore, its adaptability to small amounts of blood and spinal fluid.

ADMINISTRATION BY MOUTH

It is well known that small doses of iodids by mouth are rapidly absorbed and eliminated. The recent use of massive doses of iodids has raised the question of whether large doses are absorbed proportionately and, if they are absorbed, whether the iodid is excreted more rapidly or less rapidly than with small doses. The significant facts obtained from a study of the results after doses of 1, 5 and 20 gm. of sodium and potassium iodid by mouth are as follows:

1. Sodium iodid is excreted faster during the first hour than potassium iodid. The percentages for the one-hour interval following the administration of 1 gm. of sodium iodid and 1 gm. of potassium iodid, respectively, are 5.3 and 2.2; 7.3 and 7.2 for 5 gm., and 10.9 and 2.0 for 20 gm. This fact is of importance when the mechanism of absorption is considered.

2. No appreciable difference could be noted in the amounts of iodin eliminated after sodium and potassium iodid had been taken by mouth; the percentages were on the average a trifle higher with the sodium

* From the Section on Dermatology and Syphilology, Mayo Clinic.
* Read before the Section on Pharmacology and Therapeutics at the Seventy-Third Annual Session of the American Medical Association, St. Louis, May, 1922.

1. Kendall, E. C.: The Determination of Iodin in the Presence of Other Halogens and Organic Matter, J. Am. Chem. Soc. **34**: 894-909, 1912; The Determination of Iodine in Connection with Studies in Thyroid Activity, J. Biol. Chem. **19**: 251-256, 1914; The Determination of Iodine in Connection with Studies in Thyroid Activity, ibid. **43**: 149-159 (Aug.) 1920. Kendall, E. C., and Richardson, F. S.: Determination of Iodin in Blood and in Animal Tissue, J. Biol. Chem. **43**: 161-170, 1920.

iodid. My observations tend to show that the individual varies under different conditions.

3. The highest point of concentration of iodin in the urine is reached between the second and fourth hours after administration. The curve of urinary concentration of iodin does not always parallel the curve of iodin excreted because of the varying amounts of urine passed for each unit of time. There is no evidence that the amount of urine influences the amount of iodin excreted. Water intake effects are under investigation.

4. There is no difference in the length of time sodium and potassium iodid are retained in the body. They are practically entirely eliminated by the end of ninety-six hours, regardless of the size of the dose.

5. During the second twenty-four hour period after administration, approximately the same percentage of total iodin is eliminated, regardless of drug or dose.

No appreciable amount of iodin appears in the stools. Following the dose of 5 gm. of sodium iodid, 200 mg. of iodin was found in the feces, and after the 20 gm. of potassium iodid, 250 mg. of iodin appeared in the feces. Thus, 96 per cent. was absorbed from the gastro-intestinal tract, and this in spite of the fact that 20 gm. doses were followed by a mild watery diarrhea.

From experiments performed on two patients, it was found that no appreciable differences could be noted in the rates of elimination when the drug was given before or after meals. As in the case of the single dose, from four to five days was required for the entire elimination of the drug. During this series of experiments, blood was drawn at exactly two and three hour intervals after the second, or noon, administration. The blood concentration of the iodin was essentially the same in every instance. Many pharmacologists recommend the coincident administration of fats in the form of milk and cream on the theory that the lipoid substances hasten absorption of the iodin. My observations indicate no difference in the rate of absorption due to fats in ordinary meals, as compared with the empty stomach. Patients note less gastric irritation if the drug is taken on an empty stomach one-half hour before meals. I am unable to state at present whether or not the administration of iodids before meals lessens the liability to iodism.

Sodium iodid is usually better tolerated than potassium iodid. Two patients were observed recently who tolerated sodium iodid by mouth and intravenously, but who reacted markedly to potassium iodid by mouth.

COMPARATIVE RATES OF ELIMINATION FOLLOWING ADMINISTRATION BY MOUTH AND INTRAVENOUSLY

The intravenous administration of sodium iodid is being commercialized as a method superior to the oral administration, because of the supposed intensive effect and the slower excretion. The important facts to be noted from a study of results obtained following doses of 5, 10 and 20 gm. of sodium iodid are:

1. There is no striking difference in the rate of elimination of sodium iodid given intravenously, as compared with that given by mouth. Mendel has contended that sodium iodid administered intravenously is retained in the body for a longer period. My observations indicate that there is practically no difference between the two methods in the rate of elimination, and large doses are eliminated as rapidly as small ones.

2. There is a rapid adjustment of the body fluids to the hypertonic sodium iodid solution (10 per cent.). After 5 gm. of sodium iodid intravenously, the concentration of iodin in the urine rises immediately; while, after the 10 gm. dose, it is a trifle slower. With the relatively large dose of 20 gm., the urinary concentration remains comparatively low until the end of the first hour, after which it rapidly rises to a maximum during the fourth hour. Clinical experience coincides with these findings. Practically every adult patient tolerates 10 gm. of sodium iodid intravenously (100 c.c. of 10 per cent. solution) very well because the body is able to adjust itself to that amount. Above 10 gm., symptoms may develop from the effect of the hypertonic solution. No accumulation of the drug in the body after the large daily doses intravenously occurs. On 30 to 45 gm. daily, the same percentages were obtained as with small doses, and the drug did not remain in the body any longer.

RECTAL ADMINISTRATION OF IODIDS

Two patients were given ascending doses of potassium iodid three times a day by drop proctoclysis, with practically identical results. The maximal efficiency, with regard to the percentage of iodin excreted in the urine as compared with the amount administered by rectum, was reached with the smaller doses of approximately 3 to 10 gm. of potassium iodid a day. The iodin excreted varied from 16.9 to 43.3 per cent. of the amount administered. Increasing the dose above 10 gm. daily did not produce a corresponding increase in absorption. In both cases, severe rectal irritation developed when the dose reached 30 gm. of potassium iodid daily. Accordingly, it appears that approximately 20 to 25 per cent. of iodid given by rectum is absorbed with doses up to 10 gm. daily. Since 96 + per cent. is absorbed after administration by mouth, a daily dose of from 2 to 3 gm. by mouth is equivalent to the maximal dose by rectum; thus it would seem that rectal administration of iodids offers no significant advantage.

STUDY OF THE BLOOD CHEMISTRY OF IODIDS

In my first few series of experiments, blood serum was obtained after clotting had taken place. Since then I have found that oxalated blood serum is somewhat more convenient. Only the most minute traces of iodin were found in the packed cells, indicating that practically all, if not all, of the iodin is in the serum fraction of the blood.

SODIUM, POTASSIUM AND IODIN CONCENTRATION OF BLOOD SERUM AFTER IODIDS BY MOUTH

Doses of 1, 5, and 20 gm. of sodium and potassium iodid by mouth were used in this series of experiments. The potassium and sodium determinations were made after the methods of Kramer and Tisdall [2] under the direction of Dr. Rowntree. The most important facts noted were:

1. Following the administration of sodium iodid by mouth there was a definite marked rise in the sodium content of the blood serum proportional to the size of the dose, with no change in the potassium content.

2. In contrast to this finding, administration of potassium iodid by mouth did not produce a corresponding rise in the potassium content of the blood serum; but,

2. Kramer, B.: Direct Quantitative Determination of Potassium and Sodium in Small Quantities of Blood, J. Biol. Chem. 41: 263-274, 1920. Kramer, B., and Tisdall, F. F.: A Simple Method for the Direct Quantitative Determination of Sodium in Small Amounts of Serum, J. Biol. Chem. 46: 467-473 (May) 1921; A Clinical Method for the Quantitative Determination of Potassium in Small Amounts of Serum, ibid. 46: 339-349 (April) 1921.

on the contrary, a definite rise in the sodium content almost equal to that following the sodium iodid. Following the 20 gm. dose, only a slight rise in the potassium content was noted.

3. The iodin content of the blood serum is, in general, proportional to the dose administered. With doses of 1 and 5 gm., the highest concentration is reached about one hour after administration; while, with the 20 gm. dose, the peak is reached at the two-hour period.

SODIUM, POTASSIUM AND IODIN CONCENTRATION OF BLOOD SERUM AFTER SODIUM IODID INTRAVENOUSLY

Sodium, potassium, and iodin determinations were made on blood serum at varying intervals after intravenous injection of 10 gm. of a 10 per cent. solution of sodium iodid. As would be expected, no change occurs in the potassium concentration. The sodium content remained high for twelve hours, and returned almost to normal at the end of forty-eight hours. The iodin content, which was 43 mg. for each 100 c.c. of blood serum at the one-hour interval, dropped rapidly during the first four hours to 24.7 mg. for each 100 c.c., and then gradually to 7.1 at the end of twenty-four hours. By the end of the fourth day, a trace was found in the blood serum. In comparing these results with the iodin concentration of the blood serum after iodids by mouth, it is apparent that a dose of 5 gm. of sodium or potassium iodid three times a day by mouth will maintain blood serum concentration of 20 to 40 mg. of iodin for each 100 c.c. of blood serum for at least ten to twelve hours. Three grams of sodium or potassium iodid will give a blood serum concentration of from 13 to 30 mg. for each 100 c.c. for at least three hours after a single dose. It is apparent that a dose of from 9 to 15 gm. a day in three doses of from 3 to 5 gm. each by mouth is comparable to 10 gm. in a single dose intravenously, and has the added advantage of producing a uniformly sustained concentration of iodin during the day. It seems, from these data, that unless the intravenous method is used as an adjunct to the mouth administration, there is no special advantage in giving small doses intravenously. The giving of large doses by vein produces a very much higher concentration for a much shorter period. Mouth administration creates a moderate sustained concentration; intravenous administration of large doses creates peaks of very high concentration followed by rapid declines. The therapeutic significance of these contrasting procedures remains to be determined.

IODIN CONTENT OF BLOOD SERUM PROTEINS AFTER SODIUM, AND POTASSIUM IODID

I have employed two methods for the precipitation of the serum proteins, the tungstic acid method of Folin and Wu,[3] and the alcoholic precipitation. My results thus far are as follows:

1. Only traces of iodin were found in the serum proteins after the administration of sodium iodid by mouth.

2. In direct contrast to this finding, from 7 to 26 per cent. of the iodin following the administration of potassium iodid by mouth is found in the serum proteins. The average is 16.8 per cent.

3. Following sodium iodid intravenously, from 6 to 9.9 per cent. of the iodin is found in the serum proteins.

IODIN CONTENT OF BLOOD SERUM LIPOIDS

In a series of ten determinations, only traces of iodin were found in the alcohol, ether, and chloroform soluble fractions of blood serum following potassium and sodium iodid by mouth and sodium iodid intravenously.

COMMENT

These studies indicate that an exchange of ions occurs in the process of absorption of potassium iodid. Evidently the potassium is replaced by sodium to a large extent. Whether, in this exchange of ions, the iodin from potassium iodid is absorbed in the same form as after sodium iodid is open to question. Since the potassium is evidently absorbed to a very slight degree, the question naturally arises of whether the iodin after potassium iodid unites with the protein, the fat, or the inorganic constituents of the blood. My investigations suggest that the iodin given in the form of potassium iodid by mouth forms a sodium protein combination, while in the case of sodium iodid by mouth only traces of iodin enter into combination with the proteins. In a study not yet completed of two patients exhibiting symptoms of iodism following the administration of sodium iodid by mouth, the iodin united with the protein fraction to a greater extent than in normal persons. The foregoing observations have a direct bearing on the relative effectiveness of potassium and sodium iodid by mouth and the latter intravenously. If iodin, when administered in the form of potassium iodid, unites with the serum proteins to a greater extent than when administered as sodium iodid, the question at once arises as to whether it is this sodium-protein-iodin combination that is responsible for the action of iodids. What rôle, moreover, does this sodium-protein-iodin combination play in the production of iodism? These points must be made the subject of further study.

ABSTRACT OF DISCUSSION

DR. G. P. GRABFIELD, Boston: By the administration of small doses of iodids we were able to double and treble and in one case quadruple the nonprotein nitrogen of the blood. Dr. Osborne has used larger doses; and the question is whether our findings may be related to the protein combination that he suggests. After such doses of iodid, increase of the blood nitrogen begins about the second or third day, and continues for four or five days and gradually comes back to the previous level. Apparently, this is associated with an adjustment of the body fluids to the iodid in the blood. We have used both potassium and sodium iodid and have found the same result in the two cases. In two experiments so far done this is apparently also associated with some renal retention. If, however, the iodid is given in a single dose, this change in blood nitrogen does not occur. The chlorids remain unchanged. We are planning further work on this relation between iodid administration and the nitrogenous constituents of the blood. This will probably prove to be related to Dr. Osborne's work, and the two may prove to be mutually explanatory.

DR. E. D. OSBORNE, Rochester, Minn.: The question of iodism and anaphylaxis, so-called, as applied to cutaneous medicine has been opened up for study. The preparation of the iodin-protein combination is now being carried out. We expect in the near future to report a study on cutaneous diseases, employing this combination. Of course the relationship of the iodids to the bromids and to other such drugs in the production of skin diseases is of great importance, and this subject is just now receiving attention.

3. Wu, H.: Separate Analyses of the Corpuscles and the Plasma, J. Biol. Chem. **51**: 21-31, 1922. Folin, O., and Wu, H.: A System of Blood Analysis, J. Biol. Chem. **38**: 81-110 (May) 1919.

THE VALUE AND LIMITATIONS OF ROENTGEN-RAY DIAGNOSIS IN DIGESTIVE DISEASE *

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Because of the universal application of the roentgen ray in the diagnosis of digestive disease, I believe that the time is opportune for a frank expression of opinion, based on many years of experience, regarding its value and limitations in this field.

I shall present in this paper a consideration of (1) cases in the digestive sphere in which the diagnosis cannot be made without the use of the roentgen ray; (2) cases in which the roentgen ray can be regarded only as confirmatory; (3) cases in which the diagnosis cannot be made by the roentgen ray but can be made by a careful history and clinical investigation, and (4) cases that have been incorrectly diagnosed by the roentgen ray, as shown by their subsequent history. I shall point out some of the reasons for the incorrect interpretations made in this group of cases, and finally I shall endeavor to draw a few conclusions, based on my experience, as to the proper attitude the clinician should hold toward radiologic examinations in the diagnosis of digestive diseases.

CASES IN WHICH DIAGNOSIS COULD NOT BE MADE WITHOUT ROENTGEN RAY

Esophagus.—On the completion of a thorough esophageal investigation by historical, physical and clinical methods, few lesions remain for the roentgenograph or the fluoroscope to reveal. Rarely, indeed, does the roentgen ray discover an asymptomatic pathologic condition in this region; and when this rare instance does occur, the outstanding lesion is a diverticulum. Diverticula, however, constitute a very small percentage of esophageal cases. When obstruction is from without, notably mediastinal tumors or aortic dilatation, roentgen investigation is many times indispensable.

Stomach.—Occasionally it is impossible to diagnose gastric ulcer without the aid of the roentgen ray. Palpation before the fluoroscope, aided at times by radiography, is the most dependable mode of investigation, but even this is often attended by failure.

The discovery of hour-glass formation (functional or organic) size and form, perforating or penetrating ulcer, diverticula, foreign bodies, diaphragmatic hernia, functional capacity of postoperative openings, atony, hypertonicity, pylorospasm and hyperperistalsis accompanied by hypermotility, delayed evacuation or obstruction, may depend entirely on roentgen-ray investigation; further, the anatomic location of various gastric lesions is at times definitely determined by this method when it is quite impossible of accomplishment by any other means of investigation.

Tumors (malignant and benign).—The roentgen ray has undoubtedly discovered a certain number of malignant growths entirely unattended by any of those symptoms which bespeak the nature of the disease. However, I must confess that, in my experience, the number of these independent diagnoses is pitifully small. Nevertheless, and because this method of investigation is of such inestimable value in those rare cases, the radiologist should be encouraged to search for roentgenologic signs which will assist in making an early diagnosis—the only diagnosis of any value in this class of cases.

In those unusual instances of benign tumors with markedly atypical digestive syndromes, roentgenology is often our only means of establishing the presence of the growth.

Gallbladder and Liver.—Although reports of splendid progress made with the roentgen ray in the diagnosis of gallbladder disease have been published, and while a large percentage (from 80 to 90) of gallstone diagnoses is claimed by experienced and reliable observers, my own experience has been extremely disappointing. Perhaps we have failed to develop the proper technic! In my opinion, roentgen-ray examination in gallbladder disease is of doubtful value, unless positive shadows of stones or densely thickened gallbladder can be visualized.

The Small Intestine.—Undoubtedly the most dependable and striking findings through the use of the roentgen ray are encountered in the small intestine, notably in connection with duodenal ulcer. This knowledge assumes greater importance with the realization that many extraduodenal conditions produce what was formerly supposed to be the typical ulcer syndrome, and also because of the bizarre and entirely unsatisfactory histories frequently presented by ulcer cases.

In addition to this lesion, diverticula and irregularities due to spasm, pressure, growths and dilatation may be discovered. Irregularities should be studied with extreme caution because of the numerous variations of the normal, which so minutely simulate the pathologic.

Terminal Ileum and Colon.—While valuable information is frequently gained through visualization of the terminal ileum and colon, the fact must be borne in mind here, as elsewhere in the body, that nature permits of many variations, all of which are entirely normal. However, instances do occur in which the diagnosis of neoplasm, syphilis, tuberculosis, inflammatory conditions, diverticula, foreign bodies, various abnormalities and extra-intestinal lesions would have been impossible except for the roentgen ray. Certain radiologists claim the ability to differentiate between a syphilitic and a tuberculous or malignant lesion by variations in the roentgen-ray picture, but there is a great difference of opinion in this connection. As regards tuberculosis, Brown and Sampson's observation of a filling defect with hypermotility is of definite diagnostic value only with signs of tuberculosis elsewhere, as any ulcerative lesion can produce a similar roentgenologic picture.

CASES IN WHICH THE ROENTGEN RAY IS MERELY CONFIRMATORY

I am convinced that in a confirmatory rôle the roentgen ray is possessed of its greatest diagnostic asset.

Esophagus.—As an agent merely confirmatory, in lesions of an obstructive nature (organic or spastic, intrinsic or extrinsic in origin) in this portion of the digestive tract, roentgenology plays its most important rôle. In the majority of these cases, after dysphagia has directed our attention to the esophagus, and the introduction of a bougie has localized the site of the

* From the Gastro-Intestinal Clinic of the Johns Hopkins Hospital.
* Read before the Section on Gastro-Enterology and Proctology at the Seventy-Third Annual Session of the American Medical Association, St Louis, May, 1922.

obstruction, it is not at all unusual, through clinical investigation, to determine definitely whether the lesion is organic and malignant in nature. However, the character of the lesion may in a considerable number of cases be unquestionably established by the fluoroscope and roentgenograph.

In spastic obstruction due to neurologic malfunction or a reflex because of early organic change, one will often discover cases in which dysphagia has preceded, for a considerable time, roentgen-ray manifestations of esophageal motor insufficiency.

The location of a foreign body may be determined by means of roentgenology, but here again it is only a confirmatory measure, while in the discovery of dilatation it is quite unnecessary.

Stomach.—The approximate size, position, motor capacity (normal, hypomotility, obstruction of various grades) and tone may be ascertained by other methods, but occasionally it is advisable to use the roentgen ray as a confirmatory measure. By history and thorough clinical investigations we are enabled, in a large number of cases, to determine whether or not we are dealing with a spastic lesion of the stomach; and further, whether it is of intrinsic or extrinsic origin. In these cases the fluoroscope or roentgenograph will aid in establishing the presence of pylorospasm, hour-glass stomach or gastrospasm. In this connection it may be of interest to cite an instance.

A woman, aged 57, presented a protracted digestive history of fulness, distress, abdominal tenderness, etc. Notation was made of the extremely nervous demeanor ("too nervous to be examined"). Physical examination revealed malnutrition, asthenic type, flushed face, flabby skeletal muscles, and abdominal walls thin, atonic and relaxed; the kidneys and liver were palpated with ease; there was a distinctly palpable and tender transverse colon. In spite of a general atonicity, flabbiness, and relaxation of skeletal and abdominal musculature, besides the diagnosis of splanchnoptosis, a tentative diagnosis of hypertonicity of the stomach, normal motor power and spastic transverse colon was made. Fluoroscopic investigation confirmed the diagnosis in every detail.

A similar mode of procedure is applicable and desirable as regards carcinoma, syphilis and other lesions.

Carman's late work on the diagnosis of ulcerating gastric cancer is a step forward, and splendid in its conception; however, here again a diagnosis of carcinoma or intractable ulcer with recommendation of surgical interference will have been made, and the roentgen ray employed, only as a supportive agency.

In speaking of the diagnosis of "early cancer" which involves the gastric wall without producing a recognizable filling defect, Carman states that a local loss of flexibility may be evident on palpation, and peristalsis should be notably absent from the involved area. He immediately follows this statement with the remark that these signs alone should be interpreted with caution, but that in conjunction with a gaping pylorus, achylia and clinical indexes, they may warrant surgical exploration.

In answer to the foregoing I assert that such a diagnosis is not "early"; that the findings (local loss of flexibility and peristalsis) of which he speaks are detectable only on rare occasions, and then only by the most skilled observers; also that practically all cases with gaping pylorus, achylia, etc., will have been diagnosed by clinical methods. The presence of achlorhydria, Oppler-Boas bacilli and obstruction is not necessary for the diagnosis of gastric carcinoma.

He further states that "the novice would better limit his diagnosis to those cases in which he can demonstrate a permanent filling defect and which are at least suspicious clinically." In my opinion this is, indeed, a sad commentary on the value of the roentgen ray in "early diagnosis" of carcinoma, and certainly represents no valid argument in favor of this method as an independent means of diagnosis. There are many other conditions, exclusive of carcinoma, which may produce a filling defect.

It would be dangerous to argue that because some of the most brilliant investigators are able to diagnose early malignant lesions, it is possible for all others to do likewise.

I cannot subscribe to the view that "in the detection of cancer of the stomach the roentgen ray takes precedence over all other methods." As a matter of fact, the vast majority of our cancer cases are diagnosed before roentgen-ray study, and I am firmly convinced that when a filling defect is demonstrable by the roentgen ray, the pathologic lesion has already been discovered clinically; also in a large percentage of such cases it is too late for successful operative interference.

In syphilis and tuberculosis, the roentgen ray is decidedly confirmatory only; it is not independent and conclusive without clinical and laboratory aid. It is also usually confirmatory in the case of foreign bodies and diaphragmatic hernia. Gastric diverticula are practically unknown.

Although I feel that the greatest value of the roentgen ray lies in its corroborative capacity, there is no denying the fact that it is responsible for the discovery of many previously undetected ulcers. However, I refuse to concur in the view that the clinical findings should be practically ignored and the roentgen-ray report be considered the last word in the diagnosis of ulcer; for, when ulcers, penetrating, perforating or carcinomatous, are demonstrable fluoroscopically and radiographically, they will, doubtless, already have presented a distinguishable series of clinical signs and objective findings. I am convinced that the early diagnosis of these cases must rest with the clinician. Surely it is not inconceivable that, through assiduous and faithful study of the various aspects of these cases, physical examination, clinical investigation, etc., his skill in diagnosis will not only equal, but will also surpass that which the roentgenologist has acquired by the study and interpretation of shadows and defects on the fluoroscopic screen and roentgenographic plate.

It is absurd and dangerous to accept as conclusive the results of roentgen-ray examinations alone, just as it is a step in the wrong direction to place absolute confidence in all laboratory findings; these measures are only confirmatory.

CASES IN WHICH THE ROENTGEN RAY DETECTS NOTHING, AND A DIAGNOSIS IS MADE ON THE HISTORY, PHYSICAL EXAMINATION AND CLINICAL INVESTIGATION

I feel that it is of considerable importance to discuss this distinct class of cases.

Esophagus.—Every clinician can recall numerous cases in which absolute dependence on the roentgen-ray manifestation of disease would have resulted in no diagnosis at all, or in a diagnosis so late as to render treatment relatively valueless. This is particularly true in functional disease of the esophagus, in which spasmodic contraction occurs at times with obstruction; also contraction from a small ulcer, inflammatory states

and early malignancy, in all of which it is quite possible that the roentgen ray will not visualize the condition. Quite frequently in gastric lesions the use of the roentgen ray will be entirely barren of confirmatory evidence, and the diagnosis must be made on the clinical findings, notably acute and chronic inflammatory conditions, ulceration and malignancy.

Carman asserts that he diagnoses 95 per cent. of ulcers; however, one must remember, first, that possibly no man in the world today has an experience comparable to his, and consequently few, if any, ever attain such expertness; secondly, when ulcers have progressed to the stage of marked penetration and perforation (at which time Carman makes the great majority of his diagnoses), the diagnosis is perfectly clear from the clinical investigation. This is true not only as regards the esophagus and stomach, but also with reference to the small and large intestine, the gallbladder and the liver.

CASES INCORRECTLY DIAGNOSED BY THE ROENTGEN RAY

I am confident that my temerity in presenting this subdivision will condemn me to the outer limbo of heretics, in the judgment of the roentgenologist. However, the recollection of various humiliating and embarrassing experiences is so poignant that I am constrained to consider these cases of sufficient importance to present them for discussion.

All too often in the past have I been influenced by the roentgen-ray findings against my better judgment—a judgment based on the history, physical examination and clinical investigation; not infrequently have I been convinced of the presence of ulcerous, cancerous, syphilitic or tuberculous lesions, only to have the diagnosis denied by the roentgenogram, while subsequent course, operation or section testified to the correctness of the original pronouncement. Conversely, I have committed myself, on the word of the radiologist, to ulcers and cancers that did not exist. Wherefore, my experience having literally constituted a baptism of fire, I have come to assume a more conservative and independent attitude. When the diagnosis based on history, physical examination and clinical findings differs from the roentgen-ray diagnosis, I do not take the latter too seriously.

I am firmly convinced that most roentgen-ray manifestations are the result of those gross structural changes which come in the late stages of disease; on the other hand, a negative roentgen-ray finding does not by any means definitely rule out organic change.

Because of the inadequacies of this method, I would sound a warning as to the need of conservatism and of a well-balanced point of view which properly evaluates the findings by all the methods of investigation. No diagnosis should be made on one symptom; ergo, no diagnosis should be made by one method alone, and that mechanical.

Following an impartial and unbiased review of my work, I am convinced that at least 70 per cent. of my cases could have been correctly diagnosed without the use of the roentgen ray. I would also denounce the pernicious habit of making a diagnosis on one roentgen-ray examination. Witness, in this regard, the contradictory notes given by the same roentgenologist on the same patient at various times. It is to be noted that the muscle tone of the stomach or intestine may change in the greatest degree under various conditions, dependent on whether the sympathetic or the vagus impulse is predominating; also with interference in tone, there is a distinct change in motility, position and outline. If the patient is under a strain wherein vagus stimulation is predominating, we may witness pylorospasm or gastrospasm with marked increase in number and intensification of peristaltic waves, accompanied, most probably, by variations in motility. In such cases the position is high. Under different circumstances, with sympathetic influences in control, one may note a flabby, baglike state with low position of the organs, the tone of the stomach markedly diminished, peristaltic waves reduced, and the motor power decidedly lessened. In both instances, atypical outlines may be produced which might lead one astray in diagnosis.

In clinical medicine, repeated investigations (physical examination, blood pressure, blood, urine, gastric, rectal, occult blood, etc.) are made at different times under various circumstances. I strongly recommend the application of the same principle to roentgen-ray study. As mentioned before, one examination may reveal a normal outline; another, hypertonus; yet another, atonicity; as any one picture, considered alone, would lead to a false diagnosis, repeated examination is of paramount importance to a comprehensive and correct conception of the individual case.

Each pathologic lesion must have its initial onset, and the keen and brilliant diagnostician is he who "senses" a possibility, and perseveres until his suspicion is either developed into a certainty or completely disproved.

CONCLUSION

The ideas here presented are based entirely on personal experience and observation. I am not by any means decrying the use of the roentgen ray in the diagnosis of digestive disease, and my statements are not prompted by any condemnatory or critical spirit. In all fairness I must pay tribute to the splendid value and proved merit of this method of investigation. I desire, however, to caution the internist against the rapidly increasing habit of deferring his diagnosis until he has received the report of the roentgenologist. This endeavor to shift his responsibility to the shoulders of the radiologist bespeaks a spirit of unfairness, a shirking of duty, which augurs ill for the future of internal medicine. In this, as in all other fields of human endeavor, the best and most accurate results are to be obtained through cooperation. "Teamwork" is and should be the slogan of the hour.

ABSTRACT OF DISCUSSION

Dr. R. Walter Mills, St. Louis: Clinical and roentgen-ray methods should be correlated. Dr. Gaither calls attention to certain weaknesses in our methods. Gastro-intestinal roentgen-ray work is a highly skilled and difficult art so far attained by but a few who have had the advantage of large material. In one hospital, one form of diagnosis, say the roentgen ray, will become dominant in proportion to the enthusiasm and ability of the men who follow it. In another, clinical medicine will become dominant because of the excellence of the men who follow it. Roentgen-ray work can become so accurate as to be pernicious in its influence. No matter how thoroughly developed one method of diagnosis is, it should never be so developed at the expense of others. There are conditions in the esophagus other than diverticulosis in which the roentgen-ray findings, if not entirely decisive, are still almost indispensable. The roentgen ray is capable of an accuracy as to the determination and localization of peptic ulcer which it is difficult to believe ever has been or

ever will be approached by clinical methods. Early carcinoma of the stomach can be and is diagnosed by the roentgen ray in a stage when the disease is operable. This is less commonly true of clinical methods. The roentgen ray also affords a vast amount of help through aiding in the localization of palpable masses and giving suggestions as to operability and topographic surgical problems. On the other hand, certain conditions are diagnosable clinically when they are not by the roentgen ray. Clinical findings are best in a considerable percentage of gallbladder cases. I used to think that possibly 75 per cent. of gallstones could be shown by the roentgen ray, but now I believe that 50 per cent. would be nearer the truth.

DR. FRANKLIN W. WHITE, Boston: When the roentgen ray was first used, there was a tendency to overestimate its value; now the pendulum is swinging the other way, and we are becoming somewhat critical. We must not get a wrong idea of this valuable method; namely, that in only one fourth the cases it is essential and valuable, and in three fourths it merely confirms, is useless or wrong. Quite the reverse is true. In from three fourths to four fifths of cases it is a valuable aid. In esophageal examination, it is usually the most reliable method. Personally, I would very much prefer to swallow barium than to swallow an esophagoscope and I think many patients feel the same way. The roentgen ray has very greatly improved our diagnosis of peptic ulcer. Early diagnosis of gastric cancer has not been realized. This is partly due to the limitations of the method itself; the cancer may be overlooked because it is in the cardia or fundus, or on the posterior wall, or because it does not interfere with gastric function. An equally important reason for lack of early diagnosis is the delay in getting the patient to his first roentgen-ray examination. This factor we ought to be able to overcome. In gallbladder work, everything depends on the technic. Anything short of high-grade work is misleading and useless. In the colon, if we rely entirely on a barium meal, we may miss an early or nonobstructive cancer because of imperfect filling. When cancer of the bowel is suspected, a barium enema is always needed. Wherever there is any conflict between two methods; when the clinical findings indicate cancer and the roentgen ray reveals nothing, the case needs very careful study to get all the facts. It is essential to check one method by another. The general practitioner has fallen in a bad habit of late in digestive cases. He often takes a short history, makes a brief examination without tube tests or stool analyses, sends the patient at once to the radiologist and accepts his report as final. The roentgen-ray examination will overlook the functional changes, such as hyperacidity, achylia, hyperesthesia and catarrh, which make up fully three fourths of the digestive cases the practitioner has to treat.

DR. LEON T. LE WALD, New York: Dr. Mills has referred to the necessity of roentgen-ray work being done by those who have had experience. The evil of inadequately trained men doing roentgen-ray work has become so great in New York City that the health department has passed an amendment to the sanitary code whereby no person shall maintain a roentgen-ray laboratory without a permit from the board of health. This is just a reflection of the state of affairs existing throughout the country in regard to roentgen-ray work, and it is time to take stock, and realize the necessity of having only the very best roentgen-ray work in conjunction with clinical work. I had opportunity to perform about 5,000 necropsies, and from this experience I am able to say that, as regards the correctness of clinical diagnosis in the days just before the roentgen ray was used to any extent in gastro-intestinal work, clinical diagnosis, as compared with roentgen-ray diagnosis, had a much lower degree of accuracy. And this I have had opportunity to verify in checking up roentgen-ray diagnosis at surgical operations, at necropsies, or by prolonged clinical observation. The best results are obtained by cooperation.

DR. T. R. BROWN, Baltimore: I take it that the fundamental purpose of the paper is to call attention to the danger of an objective method and the pursuit of a short cut in trying to develop a means whereby a great deal of important work can be eliminated. One of the fundamental principles that we have always kept in mind has been that the tendency toward laboratory diagnosis or any other form of objective diagnosis, to the exclusion of other methods, is a very dangerous tendency at the present time. There is at this time a distinct tendency to study cases less satisfactorily, not taking complete histories, not making as thorough physical examinations as formerly, and to place more and more responsibility on the methods of objective diagnosis in which the roentgen ray plays a large part. Dr. Carman, I believe, made the very definite point that we should not forget that roentgen-ray diagnosis is not objective, but that it is the subjective interpretation of objective shadows. Neither should we forget that, at the present time, there are many more good clinicians than good roentgenologists, and the great danger is that the lay public has been led to believe that the roentgen ray is the last word in diagnosis. It is not. It may be the last word in the hands of a few, perhaps in certain cases, but to say indiscriminately that the roentgen ray as used today is the last word in diagnosis is fundamentally wrong. We should not veer toward one or the other method, but use every means at our command in reaching a diagnosis.

DR. E. H. KESSLER, St. Louis: I have never had the thought that the roentgenologist was to make a diagnosis. He is part of the laboratory and his work is to be correlated with the clinical findings. In one of the largest hospitals in St. Louis, the exposures are made by the engineer and the interpretation is made by the sister in charge of the laboratory or by the physician. When work of that kind is done, the author is right in everything he has said; otherwise not.

DR. SIDNEY A. PORTIS, Chicago: I believe that a great deal of reliance can be placed on the diagnosis of gallbladder disease by means of the roentgen ray. If a twelve hour motor meal shows the hepatic flexure held fixed above and the observation meal shows the stomach pulled over to the right and the duodenal bulb immobile, and if there is definite tenderness in the gallbladder region, one should suspect that a pathologic condition is present. These are valuable indirect signs of pathologic conditions of the gallbladder. I disagree with Dr. Gaither that Dr. Carman sees ulcers in only their late stages. Dr. Carman sees no different lesions as to their extent of time than Dr. Gaither sees, or we see. His cases are just as incipient as are other cases, and it is for this reason that Dr. Carman's observations are valued so highly. I quite agree that a great number of roentgenologic diagnoses are incorrect, but a great number of clinical diagnoses are also incorrect. A large number of clinicians are attempting to interpret screen and plate findings without the necessary experience, and an attempt at diagnosis on this basis by the average clinician without the necessary experience is hazardous, as far as the patient is concerned. A clinician should go over the history, physical and other laboratory findings, and see whether they fit in with the roentgen-ray picture. If there is a gross disagreement between the former and the latter, the clinician should make further search for the cause of the syndrome, and see whether the original diagnosis, excluding the roentgen-ray picture, was correct. I believe the roentgen ray has done more than any other one thing to impress on the clinician the necessity of making more correct diagnoses in gastro-intestinal diseases. In our own laboratory, one of the last things that we would discard is our roentgen-ray department.

DR. E. H. GAITHER, Baltimore: We have seen so many miserable examples of bringing mechanical medicine to the front that we stand our ground just as we did before. I disagree with Dr. Portis in regard to the importance attached to the roentgen ray. We too, have seen a few gallbladder cases and have made a few diagnoses, and sometimes we have been wrong. We have seen cases studied in various ways and definite diagnoses of gallbladder lesions made, while at operation there is presented a negative finding. Dr. Mills' statement in regard to the development of technic and its value in gallbladder cases is relatively correct. I think I said in my paper that our technic is not as good as that of Drs. Carman and Mills. I desire also to take special issue with Dr. Portis as to the stage at which Dr. Carman sees

ulcer cases. I deny that Dr. Carman sees his cases at the stage the rest of us do. Just recently, in reviewing my cases of ulcer, I was interested in noting how they ran as to time; and the stage at which they came to office consultation varied from six months to twenty years. I should like to have you go to the Mayo Clinic and find out whether Dr. Carman sees those cases in the first two or three or four months after the patient has complained of symptoms. His cases are not acute by any means.

A CONTRIBUTION TO THE PROBLEM OF NEPHRITIS AND NEPHROSIS IN PREGNANCY *

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Modern conceptions of renal disease from the standpoint of the physiologist, internist and pathologist are still far from clear. One need but read the publications of such keen observers as Volhard,[1] Strauss,[2] Christian,[3] Mosenthal,[4] Ringer,[5] Richards,[6] Kolischer,[7] Morse [8] and Epstein [9] to realize this.

It seemed desirable, therefore, to select one angle as a working basis for study, and possibly for a revision of our views concerning the renal disturbances of pregnancy.

The kidneys excrete urine by means of two mechanisms, the vascular system, especially the glomeruli, which extract the water, and the tubular system, especially the granular cells in the capital sections of the tubules, which extract the urinary solids.

This division of function has led to a corresponding disease classification: nephritis, a disease of the vascular system, particularly the glomeruli, characterized by hematuria, macroscopic or microscopic, and a pronounced rise in blood pressure; and nephrosis, a pathologic involvement of the tubular system, characterized by albumin and casts, including epithelial casts, appearing in the urine, nitrogen and sodium chlorid retention and edema. Nephrosis of any considerable duration will always lead to pronounced cardiac changes with their associated symptoms. Mixed forms, that is, a combined nephritis and nephrosis, will occasionally be found in cases of long standing.

The nephropathy of pregnancy, the so-called "kidney of pregnancy," seems to occupy a position between nephritis and nephrosis. Very probably the initial changes occur in the renovascular system; and, because of the resulting dystrophy, later on the tubular epithelium becomes involved. The nephropathy of pregnancy is essentially a disease of primiparas. Any crowding of the ovum such as occurs in hydramnios or twins increases the disposition toward this disturbance. The association with increased intra-ovular pressure seems to indicate that the primary cause of this nephropathy is a placental toxicosis. Its infrequency in subsequent pregnancies may be explained on the supposition that the system becomes immunized against this particular toxin. Prodromal symptoms, such as slight shifting edemas and moderate retention of sodium chlorid, are frequent. The condition occurs in the second half of pregnancy in the great majority of cases, and usually runs an insidious course. Most authors deny the transition of a pregnancy nephropathy into chronic nephrosis. Of course, the occurrence of pregnancy in a person with a preexisting nephrosis may, and as a rule will, aggravate the condition of renal decompensation.

In the study presented here, functional tests based on Mosenthal's [10] pioneer work were employed, coupled with capillaroscopy. One of the renal functional tests, aimed at the tubular system, is made to discover what effect on the specific gravity of a series of two hourly specimens of urine follows the administration of a dyestuff such as methylene blue or indigocarmin.

Dyestuffs are excreted by way of the tubular system and can be seen passing through the epithelial cells. If these epithelial cells are diseased, the entrance of the dyestuff particles into the tubular system cripples the extractive power of the epithelial tubular lining.

In case of nephrosis, that is, an impairment of the tubules of the renal system, in which methylene blue has been employed, the extractive power will be affected in direct proportion to the extent of involvement of the tubular system; and since the tubular system supplies to the urine the chemicals which determine its specific gravity, successive readings of the specific gravity will tell us the tale of tubule involvement. The urine must always be boiled and filtered to remove the albumin.

In the normal case, administration of 5 grains of methylene blue and serial reading of the specific gravity of the urine thereafter shows a specific gravity unchanged or increased. In severe involvement, the specific gravity will drop suddenly and remain low for many hours.

Another test, "the freshet test," is aimed at the glomeruli. With a normal intake of liquid and an established quantity rate of excretion, the sudden drinking of a liter of water followed by quantity measurements of two hourly urinations reveals the condition of the renal vascular system. In the normal case, the extra liter will have been excreted in less than four hours. A nephritis will show delay; the more involvement, the more delay or "hyposthenuria." [11]

The first extensive work in capillary microscopy was done by Lombard,[12] an American, in 1912, followed by the work of two Germans, Mueller [13] and Weiss,[14] in 1916, since which time clinicians, and laboratory workers generally, have taken up this method. The changes observed and most easily studied in the nail grooves fall into two groups: the transient, with slight deformities of the capillary loops, such as a bulge at the convexity, hairpin shapes and elongation, seen in the kidney of pregnancy and eclampsia; [15] and the perma-

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nent, with meandering loops, tennis racket forms and retardation of the blood stream, with segmentation, seen in pronounced true nephrosis, especially if combined with general circulatory disturbances due to the renal changes, and also in sclerosis of the kidney, more particularly the rapidly contracted kidney.

The differential diagnosis between nephropathy independent of pregnancy and nephropathy due to pregnancy is based on the interpretation of renal and remote symptoms plus capillaroscopy.

There is no hyposthenuria in the nephropathy of pregnancy. The kidneys have not lost their elasticity of function; they are still able to adjust themselves immediately to a sudden increased demand due to excessive intake of fluid. The passage of stains through the kidney by administration of methylene blue or indigocarmin will not cause a sudden drop in the specific gravity of the urine as is the case in genuine nephrosis. The capillary changes are of the transient type. There are no changes in the retina, and the pronounced cardiac changes so common in genuine chronic nephrosis are missing. Further differential points are the time of onset of the renal disturbance in the course of the pregnancy and the parity of the patient.

The treatment of the kidney of pregnancy should be determined by our improved knowledge of renal physiology and pathology and the relative predominance of nephritic or nephrotic symptoms. While we are not in a position to influence renal diseases by direct and specific medication, we can hasten recovery by relieving the diseased structures. If, for example, the involvement of the glomeruli predominates, the intake of fluid must be reduced to a minimum during the acute stage. The glomeruli attend mainly to the extraction of water, and any additional fluid intake would mean more work for a structure already weakened. If, however, the epithelial involvement is to the fore, a decided increase of fluids and the administration of diuretics will prevent retention of solids, because the increased amount of urine will make up for the reduction of the concentrating power of the affected kidneys.

The nephropathy of pregnancy does not furnish an indication for artificial interruption of pregnancy, but a genuine nephrosis of marked degree under certain conditions necessitates emptying the uterus. Among such indications may be mentioned retinitis albuminuria, or edema of such a degree or location as to be vital.

Idiopathic pyelitis, that is, infection and inflammation confined to the renal pelvis, occurs frequently in pregnancy. The highest figures indicate that 50 per cent. of all pregnant women are affected. It is a "Stauung" disease; that is, stagnation and damming back, the invading germ as a rule being the colon bacillus. It may become very severe, and occasionally pus and blood appear in such quantities as to give rise to the suspicion of an involvement of the renal parenchyma itself, a true pyonephrosis. The differential diagnosis is made by testing the integrity of the renal function. True pyelitis is clinically cured by a restoration of free drainage, either by the insertion of the ureteral catheter, or, in appropriate cases, by postural treatment of the patients. This is based on the observation that the obstruction of the ureter by compression invariably occurs above the pelvic brim where the ureter crosses the quadratus lumborum. Placing the patient on the side of the affected ureter causes the uterus to dislodge the fetal pole which is responsible for the compression.

Eclampsia and uremia warrant some special discussion. While there is a certain similarity as to etiology and symptoms, they are quite distinct entities. Both are based on the presence of certain toxins in the circulation, but these toxins are of a widely different character.[16] This is proved by the temperature reaction. Eclampsia is always accompanied by a rise in temperature; the opposite is true of uremia. The depressing effect of the uremic poison on the thermic centers is so decided that, when a virulent pus infection occurs during a uremic process, there is usually no fever, though under ordinary circumstances such an infection would cause alarming rises in temperature. That eclampsia is not dependent on nephritis or nephrosis, and that the toxicosis is different from that of uremia is further evidenced by the fact that, in the fatal eclampsias without any convulsions, the postmortem reveals the changes characteristic of eclampsia, which are never seen in necropsies in cases of kidney disease. Biologists and pathologists give as the cause of uremia the presence of so-called extractive materials, soluble in alcohol and ether, chemically not well defined but evidently retained protein split products; while as the cause of eclampsia, they speak of placental toxins, very probably biogenous amins. The occurrence of eclampsia with hydatid mole is further evidence that the chorionic villi are the actual source of the toxin.

Both uremia and eclampsia present the symptoms of increased intracranial and intraspinal pressure. Whether the convulsions, amaurosis and coma are due to edema of the brain or to angiospasm is still open to discussion. Th latter theory is supported by the observation that attacks are frequently cut short by therapeutic interference. The quickness with which improvement sometimes occurs certainly does not allow time for the draining off of a cerebral edema, but allows ample time for the release of an angiospasm.

With the diagnosis of eclampsia established, the principles of treatment are clear: (1) to detoxify, and thus prevent convulsions and further injury to kidneys and liver, and (2) to remove the source of the toxin, the placenta. Williams[17] and Balard[18] have found a single vigorous bloodletting a sufficient measure to satisfy the requirements in most cases. The Swiss[19] clinics are again advocating cesarean section. The Michael Reese clinic has for some years used the Veit-Stroganoff cycle of morphin and hydrated chloral (latterly substituting phenobarbital for chloral) plus purging, sweating, and venesection for high pressure, to accomplish the detoxifying, and conservative measures to favor emptying of the uterus. The action of the sedatives in suppressing the convulsions may be explained on the assumption that they relax the cerebral angiospasm.

Prognosis in nephrosis is better than in nephritis, since the epithelium of the tubular system has a regenerative power which is lacking in the glomerular system. Recovery of renal function in the kidney of pregnancy and in eclampsia is usually complete.

REPORT OF ILLUSTRATIVE CASES

CASE 1.—*Kidney of pregnancy, mild.* Mrs. C., a primipara, aged 28, developed albuminuria in the sixth month, with no casts and a blood pressure of 148, systolic, and 104, diastolic. At term, examination of the urine revealed: albumin, 1 +; casts negative; some epithelial cells and white

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blood cells; specific gravity, 1.020; methylene blue readings: 1.020-1.018-1.022-1.020; blood pressure, 160, systolic, 94, diastolic; no hyposthenuria. Capillaroscopy revealed that the loop arms were even. There was some elongation, and the flow was even. The changes were of the transient type. At labor, the albumin was 1 +; the casts were negative; the blood pressure was: 190, systolic, 110 diastolic. The blood pressure taken after delivery (by low forceps) was 166, systolic, 94 diastolic.

This was a mild toxemia promptly relieved by delivery.

Case 2.—*Nephrosis in pregnancy.* Mrs. B., a tertiodecipara, aged 42, suffered from double mitral and aortic regurgitation. At the eighth month of pregnancy, examination of the urine revealed: specific gravity, 1.018; albumin, 2 +; casts, granular and epithelial; blood pressure: 172 systolic, 110 diastolic. There was some dyspnea and decompensation. At term, the specific gravity was 1.024, and the albumin, 3 +. Casts were numerous, granular and epithelial. Methylene blue readings were: 1.024-1.024-1.018-1.021-1.021. Hyposthenuria was present more than twelve hours. Capillaroscopy revealed that all loops were tortuous, meandering, elongated, and tennis racket shape. The flow was visible and there was no retardation. The changes were of the permanent type. Delivery was spontaneous, in two hours.

This was a chronic nephrosis with circulatory changes. The tubular system was still equal to its task.

Case 3.—*Kidney of pregnancy, severe.* Mrs. L., primipara, aged 29, in the last months of pregnancy had albumin, 1 + in the urine, many leukocytes and epithelial cells, but no casts, a specific gravity of 1.018 and a blood pressure of 148 systolic, 90 diastolic. Methylene blue readings were: 1.012-1.008-1.006-1.010-1.012. Capillaroscopy revealed slightly tortuous loops, many hairpin forms and some elongation. Changes were of the transient type. The patient was vigorously purged and sweated, and the next series showed normal urine, with a specific gravity of 1.030. Methylene blue readings were: 1.011-1.014-1.011-1.013-1.018. Capillary findings remained unchanged. The blood pressure was 140 systolic, 90 diastolic. Four days later, the patient went into spontaneous labor, and in two hours and ten minutes was delivered uneventfully of a small, healthy baby. On the tenth day after delivery, the specific gravity was 1.010, and after methylene blue had been given, 1.008-1.006-1.009-1.006.

In this patient, it seemed that the tubule function was on the verge of a breakdown, as indicated by the fall in specific gravity when the dyestuff particles crippled the epithelial cells.

Case 4.—*Previous eclampsia, vulnerable tubule system.* Mrs. W., secundipara, aged 31, had eclampsia at the end of her first pregnancy (1919). The convulsions, two in number, occurring four days before delivery, were controlled by the administration of morphin and chloral. Vigorous measures for elimination were instituted; the patient went into spontaneous labor, and was delivered by low forceps. One month before the second delivery, examination of the urine revealed: specific gravity, 1.012; no albumin and no casts. Methylene blue readings were: 1.002-1.006-1.008. At term, the albumin was 1 +; there were a few hyaline casts, and the specific gravity was 1.021. After administration of methylene blue, the specific gravity was: 1.009-1.005-1.002-1.009-1.013; blood pressure, 120 systolic, 78 diastolic. There was no hyposthenuria. Capillaroscopy revealed: vessels slightly tortuous and elongated; visible flow, somewhat uneven; the transient type. Delivery was spontaneous.

This patient apparently had a vulnerable tubule system, as indicated by the lowering of the specific gravity; yet she did not develop eclampsia again, but had a spontaneous delivery.

Case 5.—*Kidney of pregnancy, nephrotic type.* Mrs. T., tertipara, aged 27, whose previous labors were normal, in late pregnancy had an albuminuria (3 +). The urine was dark straw colored; specific gravity, 1.021; and there were numerous granular casts. Methylene blue readings were 1.023-1.022-1.022-1.028. Blood pressure was 162 systolic, 80 diastolic. The patient was purged and sweated. Three days later, the urine showed 4 + albumin; innumerable hyaline and granular casts, specific gravity 1.028; blood pressure, 140 systolic, 110 diastolic. Capillaroscopy revealed only slight changes; elongation and hairpin forms with no stasis; a transient type. Labor was induced by bag insertion.

That this was a kidney of pregnancy and not a nephrosis was evidenced by the absence of albuminuric retinitis, edema and cardiac changes.

SUMMARY

1. Nephritis and nephrosis are separate and well-defined renal diseases involving different parts of the kidney mechanism, with different findings, and requiring different treatment.

2. Renal function tests and capillaroscopy are fully as important as urinalyses and blood pressure readings and are necessary to classify and treat renal pathologic conditions in pregnancy.

3. The kidney of pregnancy occupies a position between nephritis and nephrosis, can be differentiated and should be treated like the type it resembles.

4. Pyelitis of pregnancy of severe degree can be differentiated from a pyonephrosis by testing the integrity of the renal function.

5. Eclampsia seems to be due to a placental toxin which causes a special toxicosis of the brain and consequent convulsions, totally different from the uremia of nephrosis, from which it can best be distinguished by the accompanying fever, which is absent in uremia.

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ABSTRACT OF DISCUSSION

Dr. A. B. Spalding, San Francisco: Dr. Addis developed a method of quantitative kidney function tests which was based on the observation that the function of the kidney is dependent on and becomes a measure of the amount of renal tissue it contains. When the kidney is placed under strain by a patient's having been given 20 gm. of urea and water, the kidney is placed at its maximal capacity, and if the urine is drawn off each hour and 100 c.c. of blood is withdrawn in the interval, the ratio of urine urea to blood urea can be obtained. Giving more and more urea to a patient shows that the amount of urea found in the urine increases exactly proportionate to that amount. We applied this test to 163 normal men and found that the average ratio was 50.4 per cent., which has been adopted as a standard for normal renal tissue. We have applied this test to various conditions in pregnancy. In eleven normal patients in the latter months of pregnancy, there was an increase in the ratio and, therefore, it is justifiable to assume that there is hypertrophy of the kidney during normal pregnancy. In testing certain cases of pregnancy nephrosis, it was interesting to find that in all but one case there was only a moderate reduction in kidney function. With patients even with marked toxic symptoms, so far as the kidney is concerned, there is no danger of serious renal dysfunction. If we are going to treat the patients, it is the toxemia that must be treated, and not the kidney lesion. The kidney has six times more normal tissue than is needed. In applying this test to patients after they have suffered from a pregnancy toxemia, excluding cases of chronic nephritis, we were surprised to find in the majority of cases that there was a progressive loss of kidney function. That is the important thing. We have observed one patient four years. This patient did show some vascular changes, but otherwise the case looked like a fatal nephrosis. We believe that the patient received her kidney lesion in her first pregnancy, and lost her life from the damage to the tubules that persisted after pregnancy. The point I wish to bring out in this discussion is that we must have quantitative methods for estimating kidney function. Qualitative methods are good, but not sufficient.

Dr. Carl H. Davis, Milwaukee: The one point that has been most overlooked by men in general practice particularly is the importance of making a microscopic examination of

the urine whenever there is even a slight trace of albumin. This is especially true during pregnancy. If one examines a centrifuge specimen, the probabilities are that one will find a considerable number of pus cells, so that the important test in many cases is a low power microscopic examination of the uncentrifuged specimen. If in such an examination one finds a considerable number of pus cells, securing a catheterized specimen or otherwise, one should rule out the possibility of vaginal contamination. A centrifuged specimen is necessary in looking for casts. I was called to see a patient in the seventh month of pregnancy. A commercial laboratory was making all sorts of tests at considerable expense to the patient. It had constantly reported the presence of albumin in the urine. But the commercial laboratory did not use a little common sense and make a microscopic examination because that had not been called for. Owing to the type of temperature, etc., a diagnosis of typhoid had been made by the physician in charge. He had placed the patient on the starvation diet, and she was failing rapidly. A carefully taken history revealed that she had given symptoms suggesting an acute infection of the kidney, and the uncentrifuged drop of urine under the microscope showed that the urine was loaded with pus cells. Many cases are overlooked because a simple test has not been made. We should be more careful in checking up, whenever there is a trace of albumin in these cases, ruling out the possibility of vaginal contamination and determining what the condition of the urine really is.

DR. N. S. HEANY, Chicago: I should like to have Dr. Baer tell us whether he can correlate the findings by his methods with the findings obtained by Dr. Spalding, and whether they run parallel. There is a suggestion that this is not the case. Are these two methods workable together? I should like to have him tell us also about capillaroscopy.

DR. JOSEPH L. BAER, Chicago: Concerning Dr. Spalding's excellent renal function test: I had considerable difficulty in selecting a test that would be simplest to handle and most satisfactory in result. The two I selected—the dye-stuff test, aimed at the tubules, and the freshet test, aimed at the glomeruli—coupled those two requirements, and to a certain degree both are quantitative proportionally to lowering of specific gravity and retention of the liter of water. Dr. Spalding spoke about the ultimate death four years after confinement of a patient with toxemia of pregnancy with renal involvement. The prognosis in nephrosis is decidedly better than in nephritis, because the tubules have a regenerative power which is lacking in the glomeruli. If the toxic kidney leans toward the tubular type, its recovery can be complete; if toward the glomerular type, it is going to be rather badly damaged. Dr. Davis' comment on the necessity for studying the microscopic sediment requires no further comment on my part. Answering Dr. Heaney's inquiry as to the capillaroscopy, the best place for study is at the nail groove, finger or toe. The index finger lightly strapped to a wooden tongue depressor is secured on the stage of the microscope. A small bulb at one side of the finger nail gives reflected light. The skin must be made translucent by emersion oil. The normal capillaries around the nail groove show a soldier-like uniformity. They run in parallels. The loop ends are rounded like the bases of well-formed test tubes. The transient type of involvement first produces hair-pin shapes, some elongation of the capillaries, long ones next to short ones, and a bulge at the convexity. The caliber at the loop is increased. As the condition becomes permanent, meandering loops are seen. They assume grotesque shapes, such as figure eights. Some observers describe anastomosis, also tennis racquet shapes at the loop. The normal capillary stream is perfectly visible in these loops. Some assert that it has a definite rhythm in common with the respiration. With a pause in the respiration there is a pause in the capillary circuit. With inspiration, the capillary circuit moves on again. In advanced chronic nephrotics with circulatory disturbance, in sclerosis of the kidney and other deep-seated changes, there is a retardation in the blood stream. It can be seen stagnant in the capillary loops and segmented like the broken mercury column in a thermometer. Retardation and segmentation are striking changes. Lastly, in eclampsia there is apparently a complete obliteration of the lumen of the arterial arm and a wide dilatation of the venous arm.

QUARTZ LIGHT THERAPY IN SKIN DISEASES *

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The term quartz light as generally used refers to a mercury vapor light in a fused quartz vacuum tube, the mercury making the arc. Such a lamp is very rich in ultraviolet light; and, as quartz to a large degree is transparent to ultraviolet rays, these rays emerge from the lamp and can be utilized for therapeutic purposes.

As to the nature of ultraviolet light: When sunlight is passed through a prism, it is split up into many rays. We are all familiar with the visible rays of color so produced, but at each end of the visible spectrum there are innumerable invisible rays. At one end of the visible spectrum we have the invisible infra-red of longer and longer wave lengths the farther we go beyond the visible red, while at the other end beyond the visible violet we have the invisible ultraviolet, of shorter and shorter wave length the farther we go beyond the violet.

In physics, light and electricity were formerly taught as separate subjects; but today light is regarded as an electromagnetic phenomenon, and may therefore be considered as a form of electricity. The electromagnetic waves of different lengths have different properties. The shortest wave lengths known are those of the gamma rays of radium, which are measured in quintillionths of an inch, while the waves utilized in wireless and radio transmission reach many miles in length.

The ultraviolet rays which we are considering are sometimes called chemical rays, as they seem to have a chemical action. On the skin they produce what is commonly called sunburn. Now, naturally we would suppose that sunburn is caused by the hot waves of light; but the contrary is the truth. It is the cold, invisible ultraviolet light that produces sunburn. This is easily proved by laying a piece of ordinary glass on a portion of the skin exposed to sunlight and observing that the skin beneath the glass does not become sunburned. The glass is transparent to all the visible and heat waves of sunlight, but it blocks the ultraviolet rays. If, on the other hand, we substitute quartz glass, which is transparent to ultraviolet light, sunburn will occur.

The quartz lamps in use at present are of two types, air cooled and water cooled. With the air cooled lamps, large areas of skin may be treated with a single exposure; but, on account of the heat of these lamps, they must be used at a distance of 6 inches or more. For intensive effect on small areas, the water cooled lamps are more effective. In the water cooled lamps the quartz tube is surrounded with a water jacket of running water keeping the lamp constantly cool, so that the window of the lamp may be pressed directly against the skin, bringing the source of light only about an inch away from the skin. Not only does this have the advantage of close approximation of the light, but also the pressure of the quartz glass dehematizes the skin so that the rays have a deeper penetration.

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DEVELOPMENT OF THE QUARTZ LAMP

There is no doubt that heliotherapy has been used for thousands of years; but it is perhaps only in the last fifty years that attention has been directed to the therapeutic possibilities of the chemical rays of light apart from its general effect. In this work, Finsen of Copenhagen was the pioneer, and his inventions have long since proved their value in certain skin diseases, notably lupus vulgaris. On account of the success of Finsen's efforts, many turned their attention to the invention of other and simpler apparatus as substitutes for natural sunlight. The iron arc lamp and Uviol lamp were among those which attained a certain degree of success about twenty years ago, although they were both comparatively feeble sources of ultraviolet light.

In 1892, Arons discovered that an electric current passed through a vacuum tube containing a small amount of metallic mercury produced a peculiar bluish light containing no red or orange rays. Not long after, Cooper Hewitt, an American engineer, patented a lamp based on Arons' discovery, and the Cooper Hewitt lamp has become a commercial success on account of the small amount of current it consumes. Although the ordinary Cooper Hewitt lamp is very rich in ultraviolet light, the glass of the vacuum tube filters out the ultraviolet light, so that it has no effect on the skin, however valuable it may be for illumination.

The next step toward a mercury lamp of therapeutic value was the successful fusing of quartz crystals by Heraeus, and the manufacture of vacuum tubes of this material. From this time improvements followed that eventually gave us the simple, efficient quartz lamp of today. These lamps are extremely rich in ultraviolet light, and they have proved their value in the treatment of many skin diseases.

It may well be asked whether they have any advantage over natural sunlight. One advantage of some importance is that their light is always available. Another is that quartz light can be given in much larger dosage than is possible with sunlight; for example, a patch of eczema with leathery thickening of the skin might be so resistant that a day's exposure to natural sunlight might produce no effect, whereas with a water cooled quartz lamp an exposure of one or two minutes would very likely give the desired reaction.

The third advantage is the great saving in time. In a fraction of a minute it is often possible to produce on a localized lesion the same effect as would be produced by several hours of natural sunlight.

CONDITIONS IN WHICH QUARTZ LIGHT IS OF VALUE

Ulcers.—Quartz light is of value especially in those ulcers dependent on poor peripheral circulation. Of these, the most frequent to be encountered are varicose ulcers of the leg, and in many of these quartz light may be a great help by producing an active hyperemia, which seems to be a great stimulus to epithelial proliferation. A few exposures of from one to three minutes (at weekly intervals) at a distance of 10 inches from the source of light, an air cooled lamp being used, are often sufficient to clean up a foul ulcer and start proliferation of epithelium at the borders. In traumatic ulcers also, healing may be greatly hastened.

In my opinion, when skin grafts are indicated, and the local conditions are unfavorable, the use of quartz light for a few weeks previous to the operation will often greatly increase the likelihood of a successful result, by promoting the local circulation.

Birthmarks.—Birthmarks of the so-called port wine type often respond extremely well to the water cooled type of quartz lamp. The window should be pressed firmly against the area to be treated, protecting any sound skin exposed with paper or zinc oxid plaster. The exposure should depend on the case and on the strength of the lamp used. An average exposure in these cases is from five minutes to half an hour. There is no pain during the treatment other than a prickling sensation. In those cases in which before treatment the color fades readily on pressure, the results are often very good, though complete disappearance is not to be expected. The desired reaction to treatment in these cases is a blistering burn, which results in tenderness but is not particularly painful. When small areas are treated, the pain following treatment rarely causes any loss of sleep. As it is usually two weeks or more before the reaction entirely subsides, it is best not to repeat the treatment to the same area in less than a month.

Alopecia Areata.—The course of this disease is so capricious that it is difficult to judge of the value of any treatment; but it is surely true that in many cases in which bald patches have existed for months or years the hair has grown in again after five or six treatments with quartz light. Certainly it seems to be good logic to assume that an active hyperemia will tend to start a new growth of hair in these cases. In alopecia of the ordinary type, premature or otherwise, the use of ultraviolet light is not advised, as permanent results have not been obtained.

Psoriasis.—This disease, as is well known, is rare on exposed parts of the body, and it is highly probable that the action of light is the principal cause of the comparative immunity of the exposed parts. It is therefore reasonable to expect improvement following exposure to sunlight or its artificial substitutes and such improvement usually results. Unfortunately, even in cases in which the disease entirely disappears, recurrences are very common.

Chronic Eczema.—In localized patches of this disease, when there is a marked thickening of the skin, the results from quartz light therapy are often remarkable; permanent cures are not uncommon. In such cases the best results are obtained from the use of the water cooled lamps, the window being pressed against the skin for from ten seconds to a minute or more. Blistering burns often give the best end-results. The reaction should be allowed to subside before the next treatment of the same area.

Acne Vulgaris.—Severe cases of this disease are sometimes benefited by the stimulation of quartz light treatments with the air cooled lamp, but the good results are usually only temporary. Roentgen-ray treatment in such cases is likely to be of greater value, as the results are often permanent.

Lupus Vulgaris.—In selected cases of this disease, quartz light often proves of great value; in fact, in some cases it seems to be curative. The water cooled lamp should be used, and the window or quartz lens pressed against the skin for from ten minutes to half an hour, for in these cases a severe local reaction is

desired. Blistering results, and it may be several weeks before the burn entirely subsides, when another treatment should be given. As with the Finsen light, results are slow; but patience is quite likely to be rewarded in cases of this intractable disease.

Lupus Erythematosus.—In this disease the production of blistering burns is sometimes followed by good results; but, on the whole, ultraviolet light treatment, in my opinion, is rarely the method of choice.

CONCLUSIONS

Quartz light is of great value in many ulcers, especially those due to poor circulation. It is of great value in the port wine type of vascular nevus and in alopecia areata. It is often a help in the treatment of psoriasis. In localized chronic eczema with infiltration of the skin, it may prove of great value. In acne vulgaris, though the light is beneficial, improvement is usually only temporary. In lupus vulgaris it is sometimes curative. In lupus erythematosus, it may cause temporary improvement.

ABSTRACT OF DISCUSSION

DR. HOWARD FOX, New York: Two points in favor of quartz lamps are their simplicity of operation and the freedom from danger. Third degree burns are never produced, and I have yet to see a keloid following their use. The reputation of these lamps has unfortunately suffered by some exaggerated reports in which almost every kind of skin disease has been claimed to be amenable to their use. With the conservative statements of Dr. Oliver, I am in hearty accord. In alopecia areata I have found the lamps a convenient and cleanly method of giving local stimulation, which is our object in treating this capricious disease. In premature alopecia, on the other hand, I am rather skeptical as to their usefulness. They could certainly be of no value when the hair is thick, as the rays are easily stopped even by a piece of tissue paper. In lupus vulgaris, the quartz lamps are a fairly good substitution for the Finsen lamp. As the operation of the latter is costly and time consuming, it is suitable only for institutional work. For that intractable disease lupus erythematosus, the quartz lamps constitute one of several useful methods of treatment. In nevus vascularis (port wine mark), quartz therapy is certainly of value. In the treatment of this condition, however, an immense amount of patience and skill is required. Some patients are improved, some are made worse, and in only a few is a perfect cosmetic result obtained. Telangiectasia due to the roentgen ray can be improved by prolonged treatment with quartz lamps, while the telangiectasia of angioma serpiginosum shows brilliant results after such treatment. In a comparison with the roentgen ray in the treatment of skin diseases, the quartz lamps would certainly suffer. The roentgen ray as used today in measured dosage has a much wider field of usefulness in dermatology than the quartz lamps. In comparing the two agents I have found this to be notably true in psoriasis. It is my opinion that the quartz lamps have a certain restricted but valuable place in treating skin diseases, and that without them a modern dermatologic equipment would not be complete.

DR. SAMUEL AYRES, JR., Los Angeles: I want to second Dr. Oliver's observations. I was with him during the early use of the light at the Massachusetts General Hospital. The most beautiful demonstration of its value is in the treatment of varicose ulcer. Ulcers of long duration, not only of months, but even of years, have healed up perfectly under the air cooled lamp. An ulcer about the size of half a dollar, which had not healed during a period of two years, was completely healed in less than five weeks after about ten exposures. A nonrubber elastic bandage should be used for support. Curettage around the bases and edges of the ulcer in old cases is valuable in cleaning away the débris and giving a new start. In pus infection of the skin, the quartz light is also very valuable, particularly in those cases of chronic fissure inside the nasal vestibule, a condition not rare, which resists treatment. They respond very readily to the water cooled lamp with direct contact over the fissure. None of the publications I have read make any mention of any permanent pigmentation resulting. It is probably true that in very few cases such a thing happens. I have on my forearm, however, an area of pigmentation, which is of a year and a half duration, resulting from thirty seconds' exposure to a water cooled lamp. It is inconspicuous at present, and it would probably occur only in a very dark skinned person. It is something to bear in mind, however, in treating lesions about the face, especially in women with dark complexions.

DR. G. P. LINGENFELTER, Denver: One of the dermatoses that I believe Dr. Oliver failed to mention in which the quartz light is of very considerable value is pityriasis rosea. This is supposed to be a rather self-limited disease, and no treatment heretofore has proved of any very great value. From my personal experience with it, I should say that the quartz light is almost a specific in pityriasis rosea. With the erythema dose, the spots turn an ivory white. Before the desquamation has entirely subsided, the color has almost returned, and one has no further trouble. Dr. Oliver stated that there was no danger aside from the conjunctivitis. There is a little danger; at least, my personal experience would lead me to believe so. I want to warn you. Tell your patient you are going to get an erythema; it is going to desquamate. I failed to do that one time, and the result was a $5,000 damage suit. However, the suit was thrown out of court on the plaintiff's testimony.

DR. JEFFREY C. MICHAEL, Houston, Texas: In general, I agree with what has been said about the value of ultraviolet light, especially the conclusion of Dr. Fox that it is of restricted value and not comparable with the roentgen ray. It has been of considerable benefit in generalized pruritus independent of the primary condition that causes it. I have in mind, for instance, early cases of pityriasis rosea with itching, and postscabetic pruritus and generalized dermatitis. Giving these cases an erythema dose and repeating it every three days has resulted in a valuable effect so far as it relates to itching.

DR. W. W. TOMKINS, Charleston, W. Va.: What about the therapeutic results in intercostal neuralgia that follow herpes zoster, or even in cases of eczema and pruritus? Many of those cases are not responsive to the ordinary remedies. Has the light a therapeutic effect, and would it remove those distressing symptoms or hasten a cure?

DR. E. LAWRENCE OLIVER, Boston: I agree with Dr. Fox that the lamp does not compare with the roentgen ray in therapeutic value. The roentgen rays are more valuable, and more cases can be treated successfully with them, but the indications are different, that is, the ultraviolet light may succeed in cases in which roentgen rays are not indicated, and vice versa. Dr. Ayres speaks of the permanent pigmentation. A year and a half seems a good while to have it, but I doubt whether it is permanent. Dr. Lingenfelter speaks of pityriasis rosea. I have not had enough experience to say anything very definite about that disease. I also agree with him about telling the patient what is going to happen. If one is going to produce a severe, blistering burn, one wants to let the patient know it beforehand. As to pruritus, I agree with Dr. Michael. I remember a woman who had a severe itching of the palms, with weeping. After ten minutes' exposure, 8 inches distant from the air cooled lamp, the itching was relieved. I continued the treatments and cleared up the eczema almost entirely. I doubt whether the response to the roentgen ray would have been as rapid, so far as the itching was concerned anyway. Some one asked how deeply these rays penetrate. The depth of penetration is very slight. A piece of tissue paper will block the rays. The results cannot be due to penetration. The skin takes up the light superficially, and this is transmitted down below in some way. One could not get results that are obtained in the treatment of birthmarks unless the effect in some way did go deep. I do not think it is actual penetration of light. The skin probably gives off on the under surface what is taken up on the surface. I do not think it is a question of actual penetration.

Clinical Notes, Suggestions, and New Instruments

EXFOLIATIVE DERMATITIS FOLLOWING SILVER ARSPHENAMIN

LOYD THOMPSON, M.D., HOT SPRINGS, ARK.

F. H. V., a man, aged 44, consulted me, Feb. 25, 1922, complaining of "rheumatism." He admitted having had gonorrhea at 15 years of age, and a sore on the penis at 19. At the latter age, he was given mercurial inunctions and potassium iodid for five weeks, and he had no further symptoms of syphilis until two years ago. At that time, he consulted a physician in his home town for rheumatism, and in the course of a routine examination a Wassermann test was strongly positive. He received four intravenous injections of arsphenamin at weekly intervals, and following the last one developed a marked exfoliating dermatitis. He stated that the skin of the entire body "peeled off." There was also a great deal of edema of the face, hands, legs and scrotum. He was confined to bed nine weeks. He had received no antisyphilitic treatment since that time, and his health had been good except for rheumatism involving the large joints, the knees in particular.

The patient was a well nourished man; he weighed 180 pounds (81.6 kg.) and was 5 feet 10 inches (178 cm.) in height. His tongue was coated. There was a chronic pharyngitis, and the tonsils were slightly enlarged. The right epitrochlear gland was the size of a large pea. The right knee joint was swollen and tender. The pulse was 120. The systolic blood pressure was 122, the diastolic 100. Both pupils were irregular in outline, but reacted sluggishly to light and accommodation. The knee jerks were sluggish. Slight manifestations of the Romberg sign were present. A Wassermann test was negative. Spinal puncture was refused.

In view of the history and physical findings, the patient was placed on antisyphilitic treatment. He was given intramuscular injections of mercuric chlorid (0.16 gm.) in an oily base, February 27 and 28, and March 2 and 3. Because of his severe reaction to arsphenamin two years before, I decided to use silver arsphenamin, and in very small doses, March 4. There were no ill effects until the next day, when he had a chill, the temperature rose to 103 F., and he complained of itching all over his body. On the second day after the injection, there was a marked erythema on the back, arms, legs and face, and the face and the scrotum were edematous. He was decidedly worse on the third day, when the eyes were swollen almost shut. Desquamation started the fourth day affter the injection, and increased daily until within a short time it was very marked over the back, arms, face and legs.

When the patient left for home, March 21, the edema had entirely disappeared, but he was still "peeling off." He wrote me in May that his skin was entirely normal and that his health was better than it had been in years.

CONGENITAL IMPERFORATE LARYNX: A RARE ANOMALY

HOWARD L. SIEG, M.D., EARL GREY, SASK.

The mother, a secundipara, aged 22, had a normal pregnancy throughout except for the discomfort from a large amount of liquor amnii. Her first child, born two years previously, after a normal pregnancy and confinement, was normal. She and her husband were in good health and had clear family histories.

Confinement began at term, the dilating pains lasting for eight hours, and the expulsive pains for two hours. Fetal heart sounds were regular and strong throughout, and the head appeared in the left occipito-anterior position. The amniotic sac was ruptured manually—with some difficulty, owing to its toughness—and a girl was then born after a few pains. About 2 liters of liquor amnii was expelled.

On casual inspection the child appeared normal and, after a minute or two, attempted inspiration, but without success. These attempts became more violent until the lower half of the sternum was forcibly drawn backward at each effort. There seemed to be no mucus in the child's throat and, as the expulsion of the placenta seemed imminent, the cord was tied and severed. The usual procedures to establish respiration were tried and, having proved useless, attempts were made to pass a catheter into the larynx by way of the mouth and then through the nostril, but without success.

During these maneuvers it was noticed that the child had an imperforate anus, which suggested the possibility of other congenital deformities as an explanation of the difficulties. As the child was still making efforts to breathe, tracheotomy was attempted, but without success as the trachea could not be found.

Limited necropsy was allowed. All organs in the neck, thorax and abdomen appeared normal in size, situation and development with these three exceptions:

1. The rectum showed a constriction beginning 6 cm. above the tip of the coccyx and extending downward to end in atresia at the level of the cervix uteri. Its lumen was separated from that of the vagina by a thin membrane. No external dimple marked the usual situation for the anal opening and, on section, the sphincteric muscles could not be made out.

2. The trachea, beginning just below the cricoid cartilage, inclined sharply to the left and lay about 1 cm. to the left of the median line of the neck. (This may explain the difficulty in finding it, but it was easy enough to locate at necropsy).

3. The larynx appeared normal in size, shape, position and development from the external view. Section revealed the annulus of the cricoid cartilage replaced by a cartilaginous disk, 2 mm. in thickness. This disk entirely occluded the laryngeal aperture.

From available textbooks on pathology and laryngology I am led to believe that congenital imperforate larynx is a rare condition.

New and Nonofficial Remedies

THE FOLLOWING ADDITIONAL ARTICLES HAVE BEEN ACCEPTED AS CONFORMING TO THE RULES OF THE COUNCIL ON PHARMACY AND CHEMISTRY OF THE AMERICAN MEDICAL ASSOCIATION FOR ADMISSION TO NEW AND NONOFFICIAL REMEDIES. A COPY OF THE RULES ON WHICH THE COUNCIL BASES ITS ACTION WILL BE SENT ON APPLICATION. W. A. PUCKNER, SECRETARY.

MERCURIC OXYCYANIDE (See New and Nonofficial Remedies, 1922, p. 192).

The following dosage form has been accepted:

Sterile Solution of Mercury Oxycyanide: Each ampule contains 5 Cc. of solution, representing 0.008 Gm. (⅛ grain) of mercuric oxycyanide-N. N. R.

Prepared by the Gradwohl Laboratories, St. Louis.

Loeser's Intravenous Solution of Mercury Oxycyanide, 0.012 Gm.: Each ampule contains 5 Cc. of solution, representing 0.012 Gm. (3/16 grain) of mercuric oxycyanide-N. N. R.

Prepared by the New York Intravenous Laboratory, New York.

ANTIPNEUMOCOCCUS SERUM (See New and Nonofficial Remedies, 1922, p. 287).

Parke, Davis & Company, Detroit.

Antipneumococcic Serum (Polyvalent).—Prepared from the blood of horses immunized with virulent cultures of pneumococci (Types I, II, III and Group IV), and standardized against Type I culture according to the Hygienic Laboratory method. It is of the same strength with regard to Type I as Type I serum, and, in addition, contains antibodies against Types II and III and Group IV; 0.3 per cent. of cresol is added as a preservative.

Marketed in piston syringes (*Bio. 35*) containing 50 Cc., with a needle and two connections (one for injection by syringe and one for injection by gravity).

LUMINAL SODIUM (See New and Nonofficial Remedies, 1922, p. 61).

The following dosage form has been accepted:

Luminal Sodium Tablets, 1½ grains.

MEDICAL EDUCATION IN THE UNITED STATES

ANNUAL PRESENTATION OF EDUCATIONAL DATA FOR 1922 BY THE COUNCIL ON MEDICAL EDUCATION AND HOSPITALS

The tabulated statistics herewith presented are for the year ending June 30, 1922, and are based on reports received from the medical colleges and other reliable sources. We acknowledge here the splendid courtesy and cooperation of the officers of the colleges who have made the compilation of these complete statistics possible.

STATISTICS OF COLLEGES

Table 1, on pages 630-632, gives the colleges in session during 1921-1922; the population of the city; the rating given to the college by the Council on Medical Education and Hospitals; the number of students, men and women, registered during the year; the number of 1922 graduates, men and women; the number of graduates holding collegiate degrees; the number of teachers for each college; the number of weeks of actual work in the college year; the total fees for each year; the executive officer of the college, and the dates of beginning and ending of the next session. The figures in heavy-faced type show the totals by states. Beginning on page 648 are given essential facts concerning all medical colleges arranged by states.

HOME STATES OF MEDICAL STUDENTS

Table 2, on pages 634-635, shows from what state the students came who were in attendance at each medical college during the session of 1921-1922. The influence of the proximity of the medical school is seen in the fact that states having medical colleges contribute more students in proportion to the population than those which have no colleges. This is shown by the dark zone of figures running diagonally down the page. A comparison of this table with the large tables based on state board examinations,[1] which show the distribution of the alumni of each college, is interesting. The college that has widely distributed alumni usually has a student body from an equally large number of states.

The state furnishing the largest number of students this year was New York with 2,102. Illinois contributed 1,281 and Pennsylvania 1,191. The next states in the order of the number of students contributed, are: Ohio, 860; Massachusetts, 781; Michigan, 603; California, 600; Missouri, 597, and Texas, 498. Two states had less than 10 each, these being Nevada, 5, and Wyoming, 8. There were 129 students from Hawaii, Porto Rico and the Philippine Islands, and 314 students from foreign countries.

NUMBER OF STUDENTS BY CLASSES

In Table 3, on page 636, the students enrolled in each college are shown by classes. This permits one to see whether the attendance at each college is increasing or decreasing. The total attendance for the first year was 5,412 as compared with 4,825 last year and 4,234 in 1920. The second year attendance was 4,219, as compared with 3,588 last year, and 2,837 in 1920. The third year attendance was 3,355 as compared with 2,637 last year, and 3,464 in 1920. The enrolment of the fourth and fifth (intern) years, combined this year, is 3,154, as compared with 3,822 last year, and 3,553 in 1920. The first, second and third year class enrolments, therefore, show increases, respectively, of 587, 631 and 718 over the enrolments in those classes last year. The fourth (including the fifth) year class shows a decrease of 668 below that of last year. The increase in the total enrolment for the last three years indicates that readjustments under the higher entrance requirements have been completed.

1. THE JOURNAL A. M. A., State Board Number, April 29, 1922, pages 1297 to 1320, inclusive.

TABLE 4.—MEDICAL COLLEGE ATTENDANCE

Year	Non-sectarian	Homeopathic	Eclectic	Physio-Med.	Nondescript	Total
1880	9,776	1,220	830	...	...	11,826
1890	13,521	1,164	719	...	...	15,404
1900	22,710	1,900	522	...	...	25,171
1901	23,846	1,683	664	80	144	26,417
1902	24,878	1,617	765	91	150	27,501
1903	24,930	1,498	848	149	190	27,615
1904	23,662	1,309	1,014	123	234	28,142
1905	24,119	1,104	578	114	232	26,147
1906	23,116	1,085	644	110	249	25,204
1907	22,308	1,089	545	97	292	24,276
1908	20,936	891	479	90	206	22,602
1909	20,554	899	413	52	227	22,145
1910	20,136	867	455	49	19	21,526
1911	18,414	890	433	49	...	19,786
1912	17,277	827	308	...	...	18,412
1913	15,919	850	256	...	...	17,015
1914	15,438	794	270	...	...	16,502
1915	13,914	736	241	...	...	14,891
1916	13,121	638	263	...	...	14,012
1917	12,925	580	250	...	...	13,764
1918	12,727	540	138	...	225	13,630
1919	12,259	397	86	...	310	13,052
1920	13,220	386	93	...	389	14,088
1921	14,033	440	98	...	301	14,872
1922	15,247	517	85	...	291	16,140

NUMBER OF MEDICAL STUDENTS

The total number of medical students (Table 4) in the United States for the year ending June 30, 1922, excluding premedical, special and postgraduate students, was 16,140, an increase of 1,268 over last year. This is the largest enrolment of students since 1914. It is noteworthy (Table 12, page 637) that in the high grade (Class A) medical colleges both the number and the percentage of students have increased. Of the total number of students, 15,247 (94.5 per cent.) were in attendance at the nonsectarian (regular) colleges, 517 (3.2 per cent.) at the homeopathic, 85 (0.5 per cent.) at the eclectic, and 291 (1.8 per cent.) were enrolled in three nondescript colleges.

NUMBER OF MEDICAL GRADUATES

The total number of graduates for the year ending June 30, 1922, was 2,529, a decrease of 663 as compared with 1921. The number of graduates from the non-

(*Continued on page 632*)

TABLE 1—STATISTICS OF MEDICAL COLLEGES IN THE UNITED STATES AND CANADA

Marginal Number	NAME AND LOCATION OF COLLEGE	Population of City where College is Located (Census Bureau Estimate of 1922)	Classification by Council on Medical Education	No. of Students Registered 1921-22		Graduates 1922		Grads. with A.B., B.S., or Ph.B.	Number of Teachers	Weeks in College Year	Total Fees (Dollars)				Executive Officer	Session of 1922-23		Marginal Number
				Men	Women	Men	Women				1st year	2d year	3d year	4th year		Begins 1922	Ends 1923	
	ALABAMA			**62**	..	..	..	..										
1	University of Alabama School of Medicine, University (Tuscaloosa)[4]	11,996	A	62	..	..	..	..	8	34	200	200	...	...	Clyde Brooks, M.D., Dean	Sept. 4	May 22	1
	ARKANSAS			**33**	**1**	..	..	..										
2	University of Arkansas Medical Department, Little Rock	65,142	A	33	1	..	..	..	20	34	50	50	...	...	Morgan Smith, M.D., Dean	Sept. 20	June 7	2
	CALIFORNIA			**489**	**109**	**83**	**9**	**88**										
3	College of Medical Evangelists, Los Angeles [1]	576,673	B	181	17	20	3	23	140	34	236	231	211	221	P. T. Magan, M.D., Dean	Sept. 4	May 24	3
4	Stanford University School of Medicine, San Francisco	506,676	A	115	52	24	4	28	116	34	264	264	186	186	William Ophüls, M.D., Dean	Oct. 2	June 18	4
5	University of California Medical School, San Francisco [2]	506,676	A	193	40	39	2	37	187	35	290	248	235	225	L. S. Schmitt, M.D., Asst. Dean	Aug. 21	May 16	5
	COLORADO			**91**	**9**	**15**	..	**11**										
6	University of Colorado School of Medicine, Denver [2]	256,491	A	91	9	15	..	11	65	34	139	139	100	100	Charles N. Meader, M.D., Dean	Sept. 25	June 11	6
	CONNECTICUT			**156**	**9**	**21**	**2**	**16**										
7	Yale University School of Medicine, New Haven	162,537	A	156	9	21	2	16	118	35	305	300	300	320	Milton C. Winternitz, M.D., Dean	Sept. 28	June 20	7
	DISTRICT OF COLUMBIA			**540**	**12**	**59**	..	**29**										
8	Georgetown University School of Medicine, Washington	437,571	A	204	..	22	..	13	95	34	215	200	200	210	George M. Kober, M.D., Dean	Sept. 27	June 12	8
9	George Washington University Medical School, Washington	437,571	A	143	6	15	..	4	112	34	231	228	228	218	William C. Borden, M.D., Dean	Sept. 27	June 12	9
10	Howard University School of Medicine, Washington	437,571	A	193	6	22	..	12	42	33	163	158	158	165	Edward A. Balloch, M.D., Dean	Oct. 2	June 8	10
	GEORGIA			**308**	**1**	**63**	..	**28**										
11	Emory University School of Medicine, Atlanta	200,616	A	220	..	50	..	20	111	34	240	220	215	243	William S. Elkins, M.D., Dean	Sept. 27	June 5	11
12	University of Georgia Medical Department, Augusta [2]	52,548	A	88	1	13	..	8	53	34	65	60	60	60	W. H. Doughty, Jr., M.D., Dean	Sept. 14	May 28	12
	ILLINOIS			**1965**	**135**	**375**	**15**	**226**										
13	Chicago Medical School, Chicago	2,701,705	C	168	7	49	1	4	61	..	190	185	185	215	.....	.....	.....	13
14	Hahnemann Medical College of Chicago.—H.	2,701,705	B	105	5	12	1	4	83	35	200	200	200	200	J. C. Blake, Ph.D., Dean	Sept. 25	June 14	14
15	Loyola University School of Medicine, Chicago	2,701,705	A	220	11	58	6	5	137	34	250	250	250	275	Louis D. Moorhead, M.D., Dean	Oct. 2	June 16	15
16	Northwestern University Medical School, Chicago	2,701,705	A	451	..	78	..	53	165	34	220	220	216	210	Arthur I. Kendall, M.D., Dean	Oct. 3	June 16	16
17	Rush Medical College (University of Chicago)	2,701,705	A	625	87	131	6	125	244	34	235	225	225	245	John M. Dodson, M.D., Dean	Oct. 2	Jun. 16	17
18	University of Illinois College of Medicine, Chicago [2]	2,701,705	A	396	25	47	1	35	167	33	165	165	165	165	Albert C. Eycleshymer, M.D., Dean	Oct. 2	June 9	18
	INDIANA			**260**	**14**	**33**	..	**33**										
19	Indiana University School of Medicine, Bloomington-Indianapolis	314,194	A	260	14	33	..	33	164	35	125	125	150	150	Charles P. Emerson, M.D., Dean	Sept. 11	June 6	19
	IOWA			**301**	**12**	**35**	**3**	**23**										
20	State University of Iowa College of Medicine, Iowa City [2]	11,267	A	301	12	35	3	23	74	34	150	150	150	150	Lee Wallace Dean, M.D., Dean	Sept. 25	June 5	20
	KANSAS			**147**	**10**	**22**	**2**	**21**										
21	University of Kansas School of Medicine, Lawrence-Rosedale [2] [3]	433,261	A	147	10	22	2	21	62	35	131	131	133	133	Mervin T. Sudler, M.D., Assoc. Dean	Sept. 11	June 4	21
	KENTUCKY			**158**	**5**	**21**	..	**8**										
22	University of Louisville Medical Department, Louisville	234,891	A	158	5	21	..	8	119	34	265	265	272	292	Henry Enos Tuley, M.D., Dean	Sept. 19	June 4	22
	LOUISIANA			**327**	**13**	**66**	**5**	**30**										
23	Tulane University of Louisiana School of Medicine, New Orleans	387,219	A	327	13	66	5	30	148	34	225	225	215	245	Charles C. Bass, M.D., Dean	Sept. 22	June 6	23
	MARYLAND			**594**	**54**	**122**	**13**	**110**										
24	Johns Hopkins University Medical Department, Baltimore	733,826	A	297	52	67	13	79	205	33	317	267	267	267	J. Whitridge Williams, M.D., Dean	Oct. 2	June 12	24
25	Univ. of Maryland School of Med. and Coll. of P. & S., Baltimore	733,826	A	297	2	55	..	31	186	33	265	265	265	265	J. M. H. Rowland, M.D., Dean	Oct. 2	June 9	25
	MASSACHUSETTS			**1212**	**53**	**255**	**10**	**100**										
26	Boston University School of Medicine, Boston	748,060	A	138	23	22	2	10	93	35	260	230	230	240	John P. Sutherland, M.D., Dean	Sept. 28	June 18	26
27	College of Physicians and Surgeons, Boston [4]	748,060	C	68	2	19	..	..	37	..	105	140	120	115	.....	.....	.....	27
28	Harvard University Medical School, Boston	748,060	A	471	..	112	..	84	281	36	305	300	300	300	David L. Edsall, M.D., Dean	Sept. 25	June 21	28
29	Tufts College Medical School, Boston	748,060	A	414	28	75	8	6	145	32	260	245	235	240	Frank G. Wheatley, M.D., Act. Dean	Sept. 27	May 29	29
30	Middlesex College of Medicine and Surgery, Cambridge.—N.[5]	109,694	C	121	..	27	..	..	52	..	150	150	150	150	.....	.....	.....	30
	MICHIGAN			**742**	**43**	**91**	**7**	**37**										
31	University of Michigan Medical School, Ann Arbor [2]	19,516	A	524	34	63	4	29	108	35	140	140	140	140	Hugh Cabot, M.D., Dean	Sept. 25	June 18	31
32	University of Michigan Homeo. Medical School, Ann Arbor.—H.[2] [6]	19,516	A	59	2	8	..	2	..	..	...	...	...	...	.....	.....	.....	32
33	Detroit College of Medicine and Surgery, Detroit [7]	993,678	A	159	7	20	3	6	199	34	150	150	150	150	W. H. MacCraken, M.D., Dean	Oct. 2	June 16	33
	MINNESOTA			**368**	**31**	**77**	**3**	**79**										
34	University of Minnesota Medical School, Minneapolis [2]	380,582	A	368	31	77	3	79	237	35	199	199	199	199	Elias P. Lyon, M.D., Dean	Sept. 27	June 20	34
	MISSISSIPPI			**52**	**2**	..	..	..										
35	University of Mississippi School of Medicine, Oxford [4]	2,150	A	52	2	..	..	..	18	34	140	140	...	...	W. S. Leathers, M.D., Dean	Sept. 20	June 5	35
	MISSOURI			**882**	**30**	**164**	**5**	**51**										
36	University of Missouri School of Medicine, Columbia [2]	10,392	A	81	3	..	..	..	31	32	100	100	...	...	Guy L. Noyes, M.D., Dean	Aug. 29	April 25	36
37	Kansas City College of Medicine and Surgery, Kansas City.—N.[4]	433,261	C	84	6	12	2	..	32	..	200	200	200	200	.....	.....	.....	37

	MISSOURI—Continued																	
38	**Kansas City Univ. of Physicians and Surgeons, Kansas City.—N.**	433,261	C	75	5	32	..	4	21	33	190	190	185	185	A. L. McKenzie, M.D., Pres.	Sept. 11	May 24	38
39	**St. Louis College of Physicians and Surgeons, St. Louis** [5]	772,897	C	114	6	34	2	..	30	..	200	200	200	200				39
40	**St. Louis University School of Medicine, St. Louis**	772,897	A	303	..	39	..	19	163	32	250	250	250	250	Hanau W. Loeb, M.D., Dean	Oct. 2	June 1	40
41	**Washington University School of Medicine, St. Louis**	772,897	A	225	10	47	1	28	148	34	315	210	210	215	Nathaniel Allison, M.D., Dean	Sept. 28	June 14	41
	NEBRASKA			**377**	**15**	**36**	**1**	**20**										
42	**Creighton University of College of Medicine, Omaha**	191,601	A	136	2	19	1	15	68	35	180	170	170	180	Hermann von W. Schulte, M.D., Dean	Sept. 22	June 2	42
43	**University of Nebraska College of Medicine, Omaha**	191,601	A	241	13	17	..	5	73	34	145	140	130	130	Irving S. Cutter, M.D., Dean	Sept. 15	May 31	43
	NEW HAMPSHIRE			**28**	..	..	..	..										
44	**Dartmouth Medical School, Hanover** *	1,551	A	28	..	..	..	..	12	36	250	250	...	...	John M. Gile, M.D., Dean	Sept. 21	June 19	44
	NEW YORK			**1766**	**140**	**305**	**21**	**210**										
45	**Albany Medical College, Albany**	113,344	A	84	4	12	..	2	96	34	220	205	205	205	Thomas Ordway, M.D., Dean	Sept. 25	June 11	45
46	**University of Buffalo Medical Department, Buffalo**	506,775	A	197	15	21	1	5	129	34	297	292	292	292	C. Sumner Jones, M.D., Dean	Sept. 25	June 13	46
47	**Columbia University College of Phys. and Surgs., New York City**	5,620,048	A	320	36	62	6	64	303	33	332	332	332	352	William Darrach, M.D., Dean	Sept. 27	June 6	47
48	**Cornell University Medical College, New York City**	5,620,048	A	173	40	34	9	43	165	33	345	335	335	350	Walter L. Niles, M.D., Dean	Sept. 26	June 7	48
49	**Long Island College Hospital, New York City-Brooklyn**	5,620,048	A	297	14	43	4	6	131	32	356	350	350	380	Adam M. Miller, A.M., Dean	Sept. 25	May 31	49
50	**New York Homeopathic Medical College and Flower Hospital.—H.**	5,620,048	B	129	7	18	1	5	69	32	300	300	300	330	Israel S. Kleiner, Acting Dean	Sept. 18	May 9	50
51	**University and Bellevue Hospital Medical College, New York City**	5,620,048	A	408	17	79	..	55	215	36	350	320	320	345	Samuel A. Brown, M.D., Dean	Sept. 13	June 13	51
52	**Syracuse University College of Medicine, Syracuse**	171,717	A	158	7	36	..	30	115	34	324	324	324	334	Herman G. Weiskotten, M.D., Acting Dean	Sept. 20	June 13	52
	NORTH CAROLINA			**119**	**1**	..	..	..										
53	**University of North Carolina School of Medicine, Chapel Hill** *	1,483	A	80	1	..	..	..	25	34	195	195	...	...	I. H. Manning, M.D., Dean	Sept. 28	June 9	53
54	**Wake Forest College School of Medicine, Wake Forest** *	1,425	A	39	..	..	..	..	15	35	200	200	...	...	Thurman D. Kitchin, M.D., Dean	Sept. 5	May 25	54
	NORTH DAKOTA			**42**	**1**	..	..	..										
55	**Univ. of North Dakota School of Med., University (Grand Forks)***	14,010	A	42	1	..	..	..	17	35	50	50	...	...	H. E. French, M.D., Dean	Sept. 22	June 12	55
	OHIO			**691**	**35**	**144**	**5**	**92**										
56	**Eclectic Medical College, Cincinnati.—E.**	401,247	B	85	..	34	..	2	46	32	170	160	160	160	R. L. Thomas, M.D., Dean	Sept. 14	May 14	56
57	**University of Cincinnati College of Medicine**	401,247	A	193	14	43	4	35	177	34	320	320	270	215	Henry Page, M.D., Dean	Oct. 2	June 16	57
58	**Western Reserve University School of Medicine, Cleveland**	796,841	A	145	9	26	..	26	148	34	275	260	250	255	Carl A. Hamann, M.D., Dean	Sept. 28	June 14	58
59	**Ohio State University College of Medicine, Columbus** [2]	237,031	A	221	6	34	1	28	96	34	150	150	150	150	Eugene F. McCampbell, M.D., Dean	Sept. 28	June 12	59
60	**Ohio State University College of Homeo. Medicine, Columbus.—H.**[8]	237,031	B	47	6	7	..	1	..	..	...	...	...	...				60
	OKLAHOMA			**114**	**3**	**15**	..	**13**										
61	**University of Oklahoma School of Medicine, Norman-Oklahoma City**	91,295	A	114	3	15	..	13	71	35	62	70	22	22	Le Roy Long, M.D., Dean	Sept. 14	June 5	61
	OREGON			**138**	**16**	**7**	**3**	**7**										
62	**University of Oregon Medical School, Portland**	258,288	A	138	16	7	3	7	99	32	165	160	160	160	Richard B. Dillehunt, M.D., Dean	Oct. 2	June 1	62
	PENNSYLVANIA			**1356**	**163**	**261**	**39**	**128**										
63	**Hahnemann Medical College and Hospital of Philadelphia.—H.**	1,823,779	A	157	..	17	..	1	112	33	250	250	250	250	William A. Pearson, M.D., Dean	Oct. 2	June 7	63
64	**Jefferson Medical College of Philadelphia**	1,823,779	A	547	..	88	..	34	173	33	325	325	325	325	Ross V. Patterson, M.D., Dean	Sept. 25	June 1	64
65	**Temple University School of Medicine, Philadelphia**	1,823,779	B	89	1	19	..	3	115	35	180	175	165	170	Frank C. Hammond, M.D., Dean	Sept. 25	June 14	65
66	**University of Pennsylvania School of Medicine, Philadelphia**	1,823,779	A	405	31	113	5	51	180	35	348	320	320	324	William Pepper, M.D., Dean	Sept. 29	June 20	66
67	**Woman's Medical College of Pennsylvania, Philadelphia**	1,823,779	A	...	121	..	32	18	69	34	225	204	227	209	Martha Tracy, M.D., Dean	Sept. 27	June 13	67
68	**University of Pittsburgh School of Medicine, Pittsburgh**	588,343	A	158	10	24	2	21	135	34	325	310	310	320	Raleigh R. Huggins, M.D., Dean	Sept. 25	June 13	68
	SOUTH CAROLINA			**104**	**5**	**12**	**1**	**2**										
69	**Medical College of the State of South Carolina, Charleston**	67,957	A	104	5	12	1	2	61	34	165	165	165	165	Robert Wilson, Jr., M.D., Dean	Sept. 21	June 7	69
	SOUTH DAKOTA			**43**	..	..	..	..										
70	**University of South Dakota College of Medicine, Vermilion** *	2,590	A	43	..	..	..	..	10	36	60	60	...	...	C. P. Lommen, B.S., Dean	Sept. 15	June 16	70
	TENNESSEE			**438**	**6**	**56**	..	**24**										
71	**University of Tennessee College of Medicine, Memphis** [2]	162,351	A	106	2	11	..	4	122	34	117	112	107	132	James B. McElroy, M.D., Acting Dean	Sept. 30	June 11	71
72	**University of West Tennessee Medical Department, Memphis** [5]	162,351	C	7	..	4	..	..	32	31	80	80	80	80	M. V. Lynk, M.D., Dean	Sept. 26	May 20	72
73	**Meharry Medical College, Nashville**	118,342	B	176	4	28	..	14	38	31	152	152	152	172	John J. Mullowney, M.D., President	Oct. 2	May 24	73
74	**Vanderbilt University School of Medicine, Nashville**	118,342	A	149	..	13	..	6	90	34	150	150	150	175	Lucius E. Burch, M.D., Dean	Sept. 27	June 13	74
	TEXAS			**348**	**20**	**59**	**6**	**24**										
75	**Baylor University College of Medicine, Dallas**	158,976	A	104	8	22	1	9	83	35	195	190	190	185	McIver Woody, M.D., Dean	Oct. 2	June 10	75
76	**University of Texas School of Medicine, Galveston** [2]	44,255	A	244	12	37	5	15	43	32	88	58	35	23	W. Keiller, M.D., Acting Dean	Sept. 30	May 31	76
	UTAH			**57**	**1**	..	..	..										
77	**University of Utah School of Medicine, Salt Lake City** *	118,110	A	57	1	..	..	..	26	34	130	130	...	...	Perry G. Snow, M.D., Dean	Sept. 25	June 7	77
	VERMONT			**114**	**3**	**16**	..	**6**										
78	**University of Vermont College of Medicine, Burlington**	22,779	A	114	3	16	..	6	43	36	200	200	200	225	Henry Crain Tinkham, M.D., Dean	Sept. 20	June 18	78
	VIRGINIA			**294**	**21**	**44**	**3**	**20**										
79	**Medical College of Virginia, Richmond**	171,667	A	148	15	25	2	10	104	35	230	230	220	250	Manford Call, M.D., Dean	Sept. 13	June 5	79
80	**University of Virginia Department of Medicine, Charlottesville**	10,688	A	146	6	19	1	10	44	36	235	240	180	175	Theodore Hough, Ph.D., Dean	Sept. 14	June 12	80
	WEST VIRGINIA			**102**	**2**	..	..	..										
81	**West Virginia University School of Medicine, Morgantown** * [2]	12,127	A	102	2	..	..	..	15	34	90	90	...	...	John N. Simpson, M.D., Dean	Sept. 18	June 4	81

E.—Eclectic; H.—Homeopathic; N.—Nondescript.

* Gives only the first two years of the medical course.

1. This college taught 14 students from the College of Physicians and Surgeons of Los Angeles all of whom obtained degrees from the latter college, and one student of the College of Physicians and Surgeons of San Francisco who was granted a degree from the last named institution.

2. The following state universities make an additional charge for nonresidents: California, $300; Colorado, $80; Georgia, $90; Illinois, $35; Iowa, $25; Kansas, $10; Michigan, $60; Minnesota, $30; Missouri, $10; Ohio, $50; Tennessee, $50; Texas, $150; West Virginia, $150; Wisconsin, $62.

3. Population given is the combined figures for Kansas City, Mo., Kansas City, Kan., and Rosedale, Kan.

4 Figures for enrolment and graduates are those for 1920-21.

5. Figures for enrolment are approximate; graduates exact.

6. The Homeopathic Medical School was merged with the Medical School of the University of Michigan, July 1, 1922.

7. Residents of Detroit are charged only $25 for tuition.

8. The College of Homeopathic Medicine was merged with the College of Medicine of the Ohio State University, June 19, 1922.

(*Continued from page 629*)

sectarian colleges was 2,358, or a decrease of 611 as compared with last year. The number from the homeopathic colleges was 64, or 51 less than last year, and from the eclectic colleges there were 34 graduates, or 4 more than last year. The three nondescript colleges had 73 graduates, or 5 less than last year.

TABLE 5.—MEDICAL COLLEGE GRADUATES

Year	Non-sectarian	Homeo-pathic	Eclectic	Physio-Med.	Nonde-script	Total
1880	2,673	380	188	..	..	3,241
1890	3,853	380	221	..	..	4,454
1900	4,715	413	86	..	..	5,214
1901	4,879	387	148	18	12	5,444
1902	4,508	336	138	16	11	5,009
1903	5,088	420	149	24	17	5,698
1904	5,190	371	146	20	20	5,747
1905	5,126	276	153	22	23	5,600
1906	4,841	286	186	22	29	5,364
1907	4,591	225	121	11	32	4,980
1908	4,370	215	116	12	28	4,741
1909	4,163	209	84	15	44	4,515
1910	4,113	183	114	16	14	4,440
1911	4,006	152	110	5	..	4,273
1912	4,206	185	92	..	..	4,483
1913	3,679	209	93	..	..	3,981
1914	3,370	154	70	..	..	3,594
1915	3,286	195	55	..	..	3,536
1916	3,274	166	78	..	..	3,518
1917	2,134	180	65	..	..	3,379
1918	2,454	114	42	..	60	2,670
1919	2,423	89	28	..	116	2,656
1920	2,826	97	30	..	94	3,047
1921	2,909	115	30	..	78	3,192
1922	2,358	64	34	..	73	2,529

GRADUATES HOLDING DEGREES IN ARTS

Of the 2,529 medical graduates, 1,455 (see Table 11) had also obtained degrees in arts or science. This total includes those taking the combined courses in arts or science and medicine. This year 57.5 per cent. of all graduates held collegiate degrees, as compared with 46.0 per cent. last year and with 15.3 per cent. in 1910. This increase is what was expected under the general

TABLE 6.—MEDICAL GRADUATES WITH LIBERAL ARTS DEGREES

Year	Nonsectarian			Homeopathic			Eclectic			Totals		
	Graduates	A.B., B.S.	Per Cent.	Graduates	A.B., B.S.	Per Cent.	Graduates	A.B., B.S.	Per Cent.	Graduates	A.B., B.S.	Per Cent.
1910	4,113	664	16.1	183	13	7.1	114	3	2.6	4,440	680	15.3
1911	4,006	683	17.0	152	18	11.8	110	4	3.6	4,273	705	16.5
1912	4,206	744	17.7	185	15	8.1	92	4	4.3	4,483	763	17.0
1913	3,679	732	19.9	209	20	9.6	93	1	1.1	3,981	753	18.9
1914	3,370	794	23.5	154	7	4.5	70	6	8.6	3,594	807	22.5
1915	3,286	839	25.5	195	16	8.2	55	3	5.5	3,536	858	24.3
1916	3,274	928	28.3	166	20	12.0	78	...	.....	3,518	948	26.9
1917	3,134	1078	34.4	180	19	10.5	65	2	3.1	3,379	1099	32.5
1918*	2,454	1007	41.0	114	15	13.2	60	...	.....	2,670	1024	38.4
1919*	2,423	1162	48.0	89	16	18.0	28	2	7.1	2,656	1180	44.4
1920*	2,826	1307	46.2	97	11	11.3	30	3	10.0	3,043	1321	43.5
1921*	2,909	1447	48.2	115	33	28.7	30	..	....	3,192	1465	46.0
1922	2,358	1440	61.1	64	13	20.3	34	2	5.9	2,529	1455	57.5

* No graduates of nondescript colleges during the last four years were reported to have collegiate degrees.

adoption by medical schools of the entrance requirement of two years of college work. Of the 2,358 nonsectarian school graduates, 1,440, or 61.1 per cent., were reported to have baccalaureate degrees; of the 64 homeopathic graduates, 13, or 20.3 per cent., were so reported, and of the 34 eclectic graduates, 2, or 5.9 per cent., were so reported and of the 73 graduates of the

TABLE 1—STATISTICS OF MEDICAL COLLEGES IN THE UNITED STATES AND CANADA—(Concluded)

Marginal Number	NAME AND LOCATION OF COLLEGE	Population of City where College is Located (Census Bureau Estimate of 1922)	Classification by Council on Medical Education	No. of Students Registered 1921-22		Graduates 1922		(Grads. with A.B., or Ph.B., B.S., or Ph.B.	Number of Teachers	Weeks in College Year	Total Fees (Dollars)				Executive Officer	Session of 1922-23	
				Men	Women	Men	Women				1st year	2d year	3d year	4th year		Begins 1922	Ends 1923
82	WISCONSIN																
83	University of Wisconsin Medical School, Madison [2]	38,378	A	333	14	18	1	19	59	35	90	85	...	...	Charles R. Bardeen, M.D., Dean	Sept. 20	June 12
83	Marquette University School of Medicine, Milwaukee	457,147	A	186	13	18	1	19	98	34	385	295	295	275	Eben J. Carey, M.S., Dean	Oct. 2	June 14
84	PHILIPPINE ISLANDS			512	18	69	1	50	72	36	71	79	61	66	Fernando Calderon, M.D., Dean	July 1	April 4
85	University of the Philippines, College of Med. and Surg., Manila	266,943	..	109	18	24	1	5	24	36	58	62	62	62	Jose L. de Castro, M.D., Dean	July 2	Mar. 31
85	University of St. Thomas, College of Medicine and Surgery, Manila	266,943	..	403	..	45	..	45									
	CANADA [8]			3068	170	405	29	63	52	30	90	115	115	115	Cecil E. Race, A.B., Registrar	Sept. 26	May 11
86	University of Alberta Faculty of Medicine, Edmonton, Alta. [10]	60,000	..	141	14	..	..	4	49	32	200	200	200	200	John Stewart, M.D., Dean	Oct. 2	May 26
87	Dalhousie University Faculty of Medicine, Halifax, N.S.	46,619	..	159	13	20	4	..	50	32	135	144	144	134	J. C. Connell, M.D., Dean	Sept. 28	May 26
88	Queen's University Faculty of Medicine, Kingston, Ont. [11]	18,874	..	240	..	40	..	..	252	32	163	163	163	191	Alexander Primrose, M.B., Dean	Sept. 26	May 31
89	University of Toronto Faculty of Medicine, Toronto, Ont. [11]	376,538	..	980	76	126	12	10	55	31	150	158	158	183	Paul S. McKibben, Ph.D., Dean	Oct. 2	May 25
90	Western University Medical School, London, Ont. [11]	46,300	..	118	3	18	..	1	150	33	200	200	200	200	John W. Scane, M.D., Asst. Dean	Oct. 2	June 10
91	McGill University Faculty of Medicine, Montreal, Que. [11]	470,480	..	688	17	103	5	28	80	35	175	175	175	175	Louis de Lotbiniere Harwood, M.D., Dean	Sept. 15	June 15
92	University of Montreal Medical Faculty, Montreal, Que. [11]	470,480	..	305	16	49	6	..	35	36	135	135	135	135	Arthur Rousseau, M.D., Dean	Sept. 12	June 15
93	Laval University Faculty of Medicine, Quebec, Que.	78,190	..	163	..	22	..	17	35	36	135	135	135	135	S. W. Prowse, M.D., Dean	Sept. 5	May 31
94	University of Manitoba Faculty of Medicine, Winnipeg	136,035	..	274	31	27	2	3	113	35	173	173	173	173			

E.—Eclectic; H.—Homeopathic; N.—Nondescript.

2. The following state universities make an additional charge for nonresidents: California, $300; Colorado, $30; Georgia, $80; Illinois, $35; Iowa, $25; Kansas, $10; Michigan, $60; Minnesota, $30; Missouri, $10; Ohio, $50; Tennessee, $50; Texas, $150; West Virginia, $150; Wisconsin, $62.

* Gives only the first two years of the medical course.

4. Figures for enrolment and graduates are those of 1920-1921.

8. The Canadian schools count the one or two years devoted to premedical sciences as a part of the medical course. The fees for the last four years are shown. Enrolments include students of all years.

10. The University of Alberta gives the first four years of the Canadian six year course.

11. These medical schools now require a six-year course which includes both premedical and medical subjects as given in medical schools in the United States.

nondescript colleges only 4 were reported as holding bachelor's degrees in arts or science. As will be noted by referring to Table 11, of the 1,455 graduates holding baccalaureate degrees, 226—the largest number—came from the Illinois colleges. New York reported 210; Pennsylvania reported 128, and Maryland reported 110. The percentage of graduates holding collegiate degrees will probably continue to increase, since all the better medical schools are now requiring two years of college work for admission, which brings more students in reach of the combined course for the B.S. and M.D. degrees.

WOMEN IN MEDICINE

During the past year there were 989 women studying medicine, or 110 more than last year. The percentage of women to all medical students this year is 6.1 per cent., the largest percentage since the presenting of these statistics was begun. There were 154 women

TABLE 7.—WOMEN IN MEDICINE

Year	Total Women Students	Percentage of All Students, Both Sexes	Total Women Graduates	Percentage of Graduates, Both Sexes	Women's Colleges	Students	Percentage of All Women Students	Graduates	Percentage of All Women Graduates	Co-ed. Schools	Students	Percentage of All Women Students	Graduates	Percentage of All Women Graduates
1904	1,129	4.3	244	4.0	3	183	16.2	56	23.0	97	946	83.8	198	77.0
1905	1,073	4.1	219	4.0	3	221	20.6	54	24.5	96	852	79.4	165	75.5
1906	895	3.5	233	4.3	3	189	21.0	33	14.1	90	706	79.0	200	85.9
1907	928	3.8	211	4.2	3	210	22.6	39	18.5	86	718	77.4	172	81.5
1908	835	3.7	185	3.9	3	186	22.3	46	24.9	88	649	77.7	139	75.1
1909	921	4.2	162	3.7	3	169	18.4	33	20.3	91	752	81.6	129	79.7
1910	907	4.2	157	3.5	3	155	17.1	41	26.1	82	752	82.9	116	73.9
1911	680	3.4	159	3.7	2	134	19.7	36	22.6	74	546	80.3	123	77.4
1912	679	3.2	142	3.2	2	143	21.1	32	22.5	64	536	78.9	110	77.5
1913	640	3.8	154	3.8	2	138	21.6	33	21.4	55	502	78.6	121	78 6
1914	631	3.8	121	3.4	2	135	21.4	25	20.7	54	496	78.6	96	79.3
1915	592	4.0	130	3.7	2	116	19.6	38	29.2	53	462	80.4	92	70 8
1916	566	4.0	134	3.8	2	102	18.0	28	20.0	51	464	82.0	106	80.0
1917	610	4.5	153	4.5	2	81	13.3	29	18.9	58	529	86.7	124	81.1
1918	581	4.3	106	4.0	2	70	12.0	12	11.3	60	511	87.9	94	88 7
1919	686	5.2	107	4.0	1	66	10.0	7	6.5	59	620	90.4	100	93.4
1920	818	5.8	134	4.4	1	89	10.9	12	9.0	64	727	90.1	122	91.0
1921	879	5.9	151	4.7	1	103	11.5	15	10.0	63	776	88.5	136	90.0
1922	989	6.1	154	6.1	1	121	12.2	32	20.8	67	764	77.2	122	79.2

graduates this year, 3 more than last year. Of all the women matriculants, 121 were in attendance at the one medical college for women, while 764 (77.2 per cent.) were matriculated in the 67 coeducational colleges. From the one women's college there were 32 graduates, while 122 (79.2 per cent.) secured their degrees from coeducational colleges. This increase of women students in coeducational colleges is not surprising, since in recent years most of the medical schools have thrown open their doors to women.

NUMBER OF COLLEGES

Since June 30, 1921, two medical colleges, University of Michigan Homeopathic Medical School and the Ohio State University College of Homeopathic Medicine, have been closed, leaving 81 still existing. Of these, 74 are nonsectarian (regular), 3 are homeopathic, 1 is eclectic and 3 are nondescript. Two of these nondescript colleges, the Kansas City University of Physicians and Surgeons and the Middlesex College of Medicine and Surgery, are intimately connected with osteopathy or give liberal advanced standing to students of osteopathic colleges. The third, the Kansas City College of Medicine and Surgery, claims to be eclectic, but is reported as not so recognized by the National Eclectic Medical Association. The two colleges at Kansas City are reported as not recognized by the licensing boards of more than forty states.

TABLE 8.—MEDICAL COLLEGES

Year	Non-sectarian	Homeopathic	Eclectic	Physio-Med.	Nondescript	Total
1850.....	44	3	4	1	..	52
1860.....	53	6	4	2	..	65
1870.....	60	8	5	2	..	75
1880.....	76	14	8	2	..	100
1890.....	106	16	9	2	..	133
1900.....	126	22	9	2	1	160
1901.....	125	22	10	2	1	160
1902.....	126	20	9	3	2	160
1903.....	126	20	9	3	2	160
1904.....	127	19	9	3	2	160
1905.....	125	19	9	3	2	158
1906.....	130	19	8	3	2	162
1907.....	127	18	9	3	2	159
1908.....	120	18	9	2	2	151
1909.....	115	15	8	1	1	140
1910.....	109	12	8	1	1	131
1911.....	103	12	7	..	..	122
1912.....	101	11	6	..	..	118
1913.....	92	10	5	..	..	107
1914.....	87	10	5	..	..	102
1915.....	83	9	4	..	..	96
1916.....	82	10	3	..	..	95
1917.....	83	9	4	..	..	96
1918.....	79	6	2	..	3	90
1919.....	76	5	1	..	3	85
1920.....	76	5	1	..	3	85
1921.....	74	5	1	..	3	83
1922.....	74	3	1	..	3	81

LENGTH OF TERMS

During the last twenty years, as shown in Table 9, there has been a decided lengthening of college terms. This has reference to the weeks of actual work exclusive of holidays. Prior to 1904 the majority of colleges had sessions of twenty-eight weeks or less. For seven

TABLE 9.—COLLEGE TERMS

Year	23 to 26 weeks		27 to 28 weeks		29 to 30 weeks		31 to 32 weeks		33 to 34 weeks		35 to 36 weeks		Over 36 weeks	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
1901	58	36.5	42	26.4	8	5.0	26	16.4	4	2.5	18	11.3	3	1.9
1902	44	28.4	44	28.4	11	7.1	33	21.3	3	1.9	18	11.6	2	1.3
1903	33	21.4	46	29.9	15	9.7	37	24.0	2	1.3	19	12.4	2	1.3
1904	27	16.3	44	26.5	22	13.3	37	22.3	13	7.8	20	12.0	3	1.8
1905	15	9.4	35	21.8	12	7.5	44	27.5	13	8.1	28	23.8	3	1.9
1906	14	8.7	35	21.7	26	16.1	32	19.9	24	14.9	28	17.4	2	1.3
1907	6	3.7	27	16.8	26	16.1	42	26.1	29	18.0	29	18.0	2	1.3
1908	2	1.3	21	13.8	28	18.4	51	33.6	24	15.8	22	14.5	4	2.6
1909	4	2.3	17	11.6	23	16.4	51	34.9	18	12.3	30	20.5	3	2.0
1910	2	1.5	8	6.0	19	14.3	42	31.5	30	22.6	30	22.6	2	1.5
1911	..	....	6	5.0	16	13.3	37	30.8	32	26.7	28	23.4	1	0.8
1912	1	0.9	1	0.9	11	9.5	34	29.3	37	31.8	31	26.7	1	0.9
1913	..	....	3	2.8	5	4.7	29	27.4	41	38.7	27	25.5	1	0.9
1914	..	....	2	2.0	4	4.0	25	24.8	41	40.5	28	27.7	1	1.0
1915	..	....	1	1.0	5	5.3	22	23.2	36	37.9	30	31.6	1	1.0
1916	..	....	..	....	4	4.2	17	17.9	43	45.3	28	29.5	..	...
1917	..	....	..	....	1	1.0	15	15.6	46	47.9	31	32.3	..	...
1918*	..	....	..	....	2	2.2	23	25.6	37	41.1	22	24.4	..	...
1919*	..	....	..	....	1	1.2	11	12.9	44	51.8	23	27.1	1	1.2
1920*	..	....	..	....	1	1.2	10	11.8	38	44.7	29	34.1	..	...
1921*	..	....	..	....	..	....	11	13.1	39	46.4	28	33.3	..	...
1922*	..	....	..	....	..	....	10	13.1	43	56.6	23	30.3	..	...

* Information not furnished by five Class C colleges during the last five years.

years no colleges have had sessions shorter than twenty-nine weeks, and during the last two years the shortest session reported is thirty-one weeks. Sessions of from thirty-three or thirty-six weeks were reported by 66, or 79.5 per cent., of all colleges.

(*Continued on page 636*)

Marginal Number	NAME OF COLLEGE	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	Marginal Number
		Alabama....35	Arizona....11	Arkansas....91	California....600	Colorado....150	Connecticut....208	Delaware....19	Dist. of Columbia..153	Florida....65	Georgia....319	Idaho....39	Illinois....1,281	Indiana....449	Iowa....461	Kansas....284	Kentucky....171	Louisiana....123	Maine....102	Maryland....190	Massachusetts....781	
1	University of Alabama School of Medicine	54	....	1	....	....	....	....	....	....	1	....	....	....	....	....	....	1	....	....	....	1
2	University of Arkansas Medical Department	....	....	20	....	....	....	....	....	....	....	....	1	....	....	....	....	....	....	....	1	2
3	College of Medical Evangelists	....	1	....	78	9	....	....	7	1	1	2	3	1	....	5	....	1	1	2	3	3
4	Stanford University School of Medicine	....	1	....	140	....	....	....	2	....	....	1	1	....	1	....	....	1	....	....	....	4
5	University of California Medical School	....	....	....	219	2	....	....	....	....	....	1	....	....	....	....	....	....	....	....	....	5
6	University of Colorado School of Medicine	....	....	....	1	78	....	....	....	....	....	....	1	....	2	2	....	....	....	....	....	6
7	Yale University School of Medicine	....	....	....	1	....	98	....	....	....	1	....	3	....	....	....	....	....	16	2	4	7
8	Georgetown University School of Medicine	....	....	....	....	....	17	....	25	....	....	....	1	1	....	....	....	1	1	3	16	8
9	George Washington University Medical School	....	....	....	2	1	2	1	55	....	2	....	....	....	....	2	1	....	1	7	1	9
10	Howard University School of Medicine	4	....	....	....	....	2	....	38	9	3	....	1	....	....	1	9	5	....	8	2	10
11	Emory University School of Medicine	40	....	1	....	....	....	....	....	5	145	....	....	....	....	....	2	....	....	....	....	11
12	University of Georgia Medical Department	....	....	....	....	....	....	....	....	1	80	....	....	....	....	....	....	....	....	....	....	12
13	Chicago Medical School	....	....	....	1	....	....	....	....	1	2	....	149	1	1	....	1	1	....	....	2	13
14	Hahnemann Medical College of Chicago.—H.	....	....	2	....	....	1	....	....	....	....	....	31	9	1	1	....	....	....	....	....	14
15	Loyola University School of Medicine	....	....	....	....	....	....	....	....	3	1	....	159	2	10	4	3	1	....	1	....	15
16	Northwestern University Medical School	6	2	5	14	6	1	....	....	....	1	6	168	20	25	13	1	1	....	....	1	16
17	Rush Medical College (University of Chicago)	4	1	3	12	15	....	....	1	2	3	8	279	47	36	22	4	....	2	....	1	17
18	University of Illinois College of Medicine	....	1	1	10	2	....	....	1	....	....	....	302	10	19	2	1	....	....	....	....	18
19	Indiana University School of Medicine	1	....	....	1	....	....	....	....	1	....	....	1	248	2	....	1	....	....	....	....	19
20	State University of Iowa College of Medicine	....	....	....	1	....	....	....	....	....	....	2	6	....	279	....	1	....	....	....	....	20
21	University of Kansas School of Medicine	....	1	....	....	1	....	....	....	....	....	....	1	....	1	136	....	....	....	....	....	21
22	University of Louisville Medical Department	2	....	....	1	....	....	....	....	1	1	....	1	31	1	2	77	....	1	....	1	22
23	Tulane University of Louisiana School of Medicine	60	1	23	2	....	2	....	1	11	9	....	2	1	....	1	1	93	....	....	....	23
24	Johns Hopkins University Medical Department	6	....	1	10	3	8	3	8	2	15	1	8	6	2	3	5	1	3	73	7	24
25	University of Maryland Sch. of Med. & Coll. of P. & S.	1	....	....	....	....	18	2	3	4	....	1	....	....	....	....	2	....	1	65	2	25
26	Boston University School of Medicine	1	....	....	1	....	8	....	....	....	4	....	....	....	....	1	....	....	13	....	49	26
27	College of Physicians and Surgeons, Boston *	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	70	27
28	Harvard University Medical School	3	....	....	21	7	12	....	2	2	6	1	10	2	3	2	3	....	29	3	129	28
29	Tufts College Medical School	1	....	....	....	....	20	....	....	....	....	....	1	....	....	....	....	....	15	....	305	29
30	Middlesex College of Medicine and Surgery.—N.†	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	121	30
31	University of Michigan Medical School	2	....	1	4	2	1	....	1	1	4	1	15	28	2	1	3	....	....	2	4	31
32	University of Michigan Homeo. Medical School.—H.	....	....	....	2	....	....	....	....	....	....	....	1	1	....	....	....	....	....	....	....	32
33	Detroit College of Medicine and Surgery	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	1	33
34	University of Minnesota Medical School	....	....	....	2	1	....	....	....	....	....	....	1	....	6	....	....	....	....	1	....	34
35	University of Mississippi School of Medicine	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	2	....	....	....	35
36	University of Missouri School of Medicine	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	36
37	Kansas City College of Medicine and Surgery.—N.*	....	....	....	....	....	....	....	....	....	....	....	....	....	....	20	....	....	....	....	....	37
38	Kansas City University of Phys. and Surgs.—N.	1	....	....	1	2	2	....	1	....	....	1	3	3	2	8	1	....	....	....	3	38
39	St. Louis College of Physicians and Surgeons †	....	2	....	....	....	....	....	....	....	....	....	14	....	....	8	....	....	....	....	....	39
40	St. Louis University School of Medicine	1	....	....	18	3	....	....	....	1	....	1	37	8	12	11	....	4	....	1	....	40
41	Washington University School of Medicine	....	....	7	11	5	....	....	....	....	1	....	31	1	6	12	1	....	....	....	1	41
42	Creighton University College of Medicine	....	....	....	1	5	....	....	....	....	....	2	2	2	22	9	....	....	....	....	....	42
43	University of Nebraska College of Medicine	....	....	....	7	4	1	....	....	....	....	1	1	....	9	6	....	....	....	....	....	43
44	Dartmouth Medical School	....	....	....	....	....	2	....	....	....	....	....	1	....	....	....	....	....	1	....	9	44
45	Albany Medical College	....	....	....	....	....	1	....	....	....	....	....	....	....	....	....	....	....	....	....	1	45
46	University of Buffalo Medical Department	....	....	....	....	....	2	....	....	....	....	....	....	....	....	....	....	....	....	....	....	46
47	Columbia University College of Phys. and Surgs.	2	1	1	4	1	15	....	....	....	3	....	1	2	....	....	1	....	....	....	7	47
48	Cornell University Medical College	1	....	....	2	....	9	....	....	....	....	....	2	....	....	1	2	1	1	....	9	48
49	Long Island College Hospital	....	....	....	....	....	7	....	....	....	....	....	....	....	....	....	....	....	....	....	1	49
50	New York Homeopathic Med. Coll. & Flower Hosp.—H.	....	....	....	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	50
51	University and Bellevue Hospital Medical College	....	....	....	2	....	9	....	1	....	2	....	....	....	....	....	....	....	1	....	....	51
52	Syracuse University College of Medicine	....	....	....	....	....	1	....	1	....	....	....	....	....	....	....	....	....	....	....	3	52
53	University of North Carolina School of Medicine	....	....	....	....	....	....	....	....	1	1	....	....	....	....	....	....	....	....	....	....	53
54	Wake Forest College School of Medicine	....	....	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	54
55	University of North Dakota School of Medicine	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	55
56	Eclectic Medical College, Cincinnati.—E.	....	....	1	1	....	1	....	....	....	....	....	3	....	....	....	7	....	....	1	....	56
57	University of Cincinnati College of Medicine	....	....	....	1	....	....	....	....	....	....	....	3	11	....	1	13	....	....	....	....	57
58	Western Reserve University School of Medicine	2	....	....	....	....	....	....	....	2	....	....	....	1	....	2	....	....	2	....	....	58
59	Ohio State University College of Medicine	....	....	....	1	....	....	....	....	....	1	....	....	....	....	....	....	....	....	....	....	59
60	Ohio State University College of Homeo. Med.—H.	1	....	....	....	....	....	....	....	....	....	....	....	1	....	....	1	....	....	1	....	60
61	University of Oklahoma School of Medicine	....	....	1	....	....	....	....	....	....	....	....	....	....	....	1	....	....	....	....	....	61
62	University of Oregon Medical School	....	....	....	11	1	....	....	....	....	....	4	....	....	1	....	....	....	....	....	....	62
63	Hahnemann Medical College and Hosp. of Phila.—H.	....	....	....	2	....	1	3	....	....	....	....	....	....	1	....	1	....	....	....	....	63
64	Jefferson Medical College of Philadelphia	1	....	1	3	....	11	7	2	1	5	2	4	5	1	....	....	....	5	5	15	64
65	Temple University School of Medicine	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	....	....	65
66	University of Pennsylvania School of Medicine	2	....	....	5	....	4	1	....	2	1	....	2	3	2	4	2	....	2	6	2	66
67	Woman's Medical College of Pennsylvania	1	....	....	3	....	1	2	....	2	....	....	1	1	1	1	2	....	....	4	1	67
68	University of Pittsburgh School of Medicine	....	....	....	....	....	....	....	....	....	....	....	1	....	....	....	....	....	....	....	....	68
69	Medical College of the State of South Carolina	....	....	....	....	....	....	....	....	....	1	....	....	....	....	....	....	....	....	....	....	69
70	University of South Dakota College of Medicine	....	....	....	....	....	....	....	....	....	....	....	....	....	5	....	....	....	....	....	....	70
71	University of Tennessee College of Medicine	8	....	1	....	....	....	....	....	1	5	....	4	....	....	....	1	1	....	....	....	71
72	University of West Tennessee Medical Department †	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	72
73	Meharry Medical College	3	....	14	....	....	....	....	1	2	12	....	8	1	....	1	5	5	....	....	1	73
74	Vanderbilt University School of Medicine	23	....	5	....	....	....	....	....	2	5	....	....	....	....	....	15	1	....	....	....	74
75	Baylor University College of Medicine	1	....	1	1	....	....	....	....	....	....	....	....	....	1	1	....	1	....	....	....	75
76	University of Texas School of Medicine	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	76
77	University of Utah School of Medicine	....	....	....	1	....	....	....	....	....	....	....	4	....	....	....	....	....	....	....	....	77
78	University of Vermont College of Medicine	....	....	....	....	....	7	....	....	1	....	....	....	....	....	....	....	....	6	....	6	78
79	Medical College of Virginia	....	....	....	....	....	1	....	1	1	....	....	....	....	....	....	....	1	....	2	....	79
80	University of Virginia Department of Medicine	1	....	....	1	....	2	....	2	5	3	....	....	....	....	....	2	1	....	2	1	80
81	West Virginia University School of Medicine	....	....	....	....	....	1	....	....	....	....	....	....	....	....	....	....	....	....	....	1	81
82	University of Wisconsin Medical School	....	....	....	....	2	....	....	....	....	....	....	8	2	1	....	....	....	....	....	....	82
83	Marquette University School of Medicine	....	....	....	....	....	....	....	....	....	....	....	9	....	6	....	2	....	....	....	....	83
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	

E.—Eclectic; H.—Homeopathic; N.—Nondescript.

* Figures are for 1920-21; distribution approximate.

† Figures and distribution approximate.

Marginal Number	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51		Marginal Number
	Michigan.....603	Minnesota.....471	Mississippi.....145	Missouri.....597	Montana.....29	Nebraska.....321	Nevada.....5	New Hampshire.....47	New Jersey.....436	New Mexico.....14	New York.....2,102	North Carolina.....340	North Dakota.....100	Ohio.....860	Oklahoma.....155	Oregon.....156	Pennsylvania.....1,191	Rhode Island.....85	South Carolina.....188	South Dakota.....103	Tennessee.....190	Texas.....498	Utah.....110	Vermont.....86	Virginia.....329	Washington.....122	West Virginia.....178	Wisconsin.....446	Wyoming.....8	Philippines, etc. 129	Foreign.....314	Totals.....16,140	
1	....	....	....	....	....	....	....	....	1	....	5	....	....	2	....	....	1	....	1	....	1	....	....	....	1	....	....	1	....	....	....	62	1
2	....	....	....	....	....	....	....	....	1	....	5	....	....	....	....	....	1	....	....	....	....	2	....	....	....	1	....	1	....	....	2	34	2
3	10	5	....	2	....	10	1	....	....	1	3	1	1	2	2	6	2	....	....	1	4	....	....	....	1	14	....	1	....	2	14	198	3
4	1	....	....	....	....	1	1	....	....	....	1	....	....	2	....	2	....	....	....	....	....	1	2	....	....	3	....	1	....	3	2	167	4
5	....	....	....	....	....	1	....	....	....	....	1	....	....	1	1	3	....	....	....	....	....	....	1	....	....	1	....	....	....	....	2	233	5
6	....	....	....	1	....	....	....	....	....	2	2	....	....	....	1	....	....	....	....	1	....	2	1	....	1	....	1	....	1	1	2	100	6
7	....	....	....	....	....	....	....	....	4	....	12	....	....	12	....	1	4	1	1	....	....	....	....	....	4	....	....	....	....	1	3	165	7
8	1	4	....	....	1	....	....	....	34	....	41	....	1	2	....	....	31	8	....	....	....	1	....	....	4	....	....	....	....	10	1	204	8
9	1	1	....	....	....	....	....	....	12	....	17	3	1	3	....	....	8	....	....	....	....	....	6	....	8	....	1	....	....	1	12	149	9
10	2	....	3	2	....	....	....	....	3	....	11	16	....	5	2	....	12	2	6	....	3	4	....	....	21	....	2	....	....	4	19	199	10
11	....	....	3	2	....	....	....	....	....	....	1	8	....	....	....	....	....	....	3	....	7	....	....	....	1	....	1	....	....	....	1	220	11
12	....	....	....	....	....	....	....	....	....	....	....	1	1	....	....	....	....	....	3	....	....	....	....	....	1	....	....	....	....	....	2	89	12
13	....	....	....	1	....	1	....	....	....	....	2	....	....	....	....	....	2	....	....	....	....	....	....	....	....	....	....	....	....	4	6	175	13
14	2	2	....	3	....	....	....	....	2	....	8	....	2	7	1	....	4	....	1	2	....	1	....	....	2	1	....	....	....	11	16	110	14
15	8	2	....	3	....	....	....	....	....	....	5	....	....	2	....	1	4	....	....	....	1	....	....	....	1	3	2	5	....	9	3	231	15
16	16	9	9	18	2	8	....	....	3	....	3	....	11	11	8	3	6	....	....	4	1	6	10	....	....	22	....	18	....	3	10	451	16
17	13	13	3	7	4	12	2	2	1	1	7	1	14	20	1	10	8	....	1	25	4	15	8	....	1	12	1	62	1	6	17	712	17
18	6	5	....	2	1	2	....	....	....	1	3	....	6	2	....	....	5	....	1	4	....	....	2	....	....	2	....	19	....	7	4	421	18
19	1	3	....	....	....	....	....	....	....	....	3	1	....	7	....	....	1	....	....	....	....	....	....	....	1	....	....	....	....	1	1	274	19
20	....	7	....	....	....	2	....	....	2	....	....	....	....	1	....	....	....	....	....	3	....	2	....	....	....	....	....	3	....	4	....	313	20
21	....	....	....	9	....	....	....	....	....	1	....	....	....	....	3	....	....	....	....	....	....	....	....	....	....	....	....	....	....	3	1	157	21
22	1	....	....	2	....	....	....	....	....	1	2	1	....	15	....	2	2	....	1	....	2	....	....	....	5	....	9	1	....	....	....	163	22
23	....	....	34	1	....	....	....	....	2	....	11	15	....	....	4	....	2	....	3	1	5	43	1	....	2	....	....	....	....	....	9	340	23
24	5	1	1	2	....	2	....	....	9	....	27	12	1	17	1	4	26	4	11	1	4	10	....	....	19	2	8	1	1	....	15	349	24
25	2	....	....	....	....	....	....	....	40	....	62	18	....	1	....	....	38	2	1	....	1	....	3	....	5	....	24	....	....	....	3	299	25
26	....	....	....	....	....	1	....	3	4	....	48	2	....	1	....	....	1	3	3	....	....	....	....	1	3	....	....	1	....	5	8	161	26
27	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	70	27
28	7	2	1	14	1	10	....	8	13	....	39	1	3	21	5	9	18	15	3	2	2	10	4	2	4	4	3	12	1	1	21	471	28
29	1	....	....	....	....	....	....	17	6	....	33	....	....	....	....	....	3	31	....	....	....	....	....	....	1	....	....	....	....	....	....	8	442	29
30	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	121	30
31	294	4	....	5	....	3	....	2	8	1	38	3	....	58	....	1	29	2	1	1	2	....	....	1	2	4	1	3	....	5	18	558	31
32	38	....	....	....	....	1	....	....	....	....	6	....	2	3	....	....	4	....	1	....	....	....	....	....	....	....	....	1	....	1	....	61	32
33	159	....	....	....	....	....	....	....	....	....	....	....	....	2	....	....	2	....	....	....	....	....	....	....	....	....	....	....	....	....	1	166	33
34	....	253	....	1	1	....	....	1	....	....	1	1	8	....	....	....	....	....	....	6	....	....	....	....	....	3	....	5	....	....	8	399	34
35	....	....	48	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	2	....	....	....	....	....	....	....	1	....	54	35
36	....	....	....	78	....	....	....	....	....	....	1	....	....	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	3	84	36
37	....	....	....	70	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	90	37
38	....	2	1	22	....	....	1	....	2	....	3	....	....	....	1	1	3	....	....	....	....	....	1	....	1	3	....	1	....	2	8	80	38
39	....	....	....	90	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	....	....	....	....	....	....	....	....	....	5	120	39
40	11	11	....	103	1	....	....	....	2	2	8	1	3	35	1	1	3	....	....	2	....	1	....	....	1	2	....	6	1	5	6	303	40
41	1	2	1	110	4	1	....	....	1	1	2	....	1	2	1	....	1	....	....	2	....	3	6	....	....	4	....	8	....	3	5	235	41
42	....	6	....	2	6	62	....	....	....	1	....	....	2	1	....	....	....	....	....	8	....	....	....	....	....	6	....	....	....	1	....	138	42
43	....	4	....	6	2	193	....	....	....	....	3	....	....	....	....	1	....	....	....	3	....	....	....	....	....	....	....	....	3	2	8	....	254	43
44	....	....	....	1	....	1	....	6	....	....	6	....	....	....	....	....	....	....	....	....	....	....	....	1	....	....	....	....	....	....	....	28	44
45	....	....	....	....	....	....	....	....	3	....	78	....	....	....	....	....	....	1	....	....	....	....	....	....	....	....	....	....	....	....	4	88	45
46	....	....	....	....	....	....	....	....	....	....	196	....	....	2	....	....	11	....	....	....	....	....	....	....	....	....	....	....	....	....	1	212	46
47	....	....	1	1	....	....	....	1	38	....	251	1	....	4	....	....	3	2	....	....	1	1	1	2	1	....	1	1	....	1	7	356	47
48	....	....	....	....	....	1	....	2	22	....	135	2	....	1	....	....	8	1	2	....	....	....	2	2	....	1	1	....	....	1	4	213	48
49	....	....	....	....	....	....	....	....	11	....	288	....	....	....	....	....	3	....	....	....	....	....	....	1	....	....	....	....	....	....	....	311	49
50	....	....	....	....	....	....	....	....	5	....	126	....	....	....	....	....	....	....	....	....	....	....	1	....	....	....	....	....	....	....	3	136	50
51	....	....	4	3	....	....	....	....	63	....	328	....	....	1	....	....	5	....	....	....	1	....	1	....	....	....	....	....	....	....	4	425	51
52	....	....	....	....	....	....	....	....	5	....	143	4	....	....	....	....	5	....	....	....	....	....	....	....	1	....	....	....	....	1	3	165	52
53	....	....	....	....	....	....	....	....	....	....	....	78	....	....	....	....	....	....	....	....	....	....	....	....	1	....	....	....	....	....	....	81	53
54	....	....	....	....	....	....	....	....	2	....	2	32	....	....	....	....	1	....	....	....	....	....	....	....	1	....	....	....	....	....	....	39	54
55	....	2	....	....	2	....	....	....	....	....	....	....	39	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	43	55
56	3	....	....	1	....	....	....	....	1	....	22	....	....	35	....	....	6	....	....	....	....	1	....	....	....	....	1	....	....	....	1	85	56
57	....	2	....	....	....	1	....	....	....	....	....	....	....	152	....	....	1	....	....	....	2	....	....	....	1	....	12	1	....	2	4	207	57
58	1	....	....	2	....	1	....	....	1	....	2	....	....	110	....	....	13	....	....	....	....	....	1	....	2	1	6	2	....	....	3	154	58
59	1	....	1	....	....	....	....	....	1	....	1	....	....	212	....	....	2	....	1	....	....	....	....	....	....	....	2	....	....	3	1	227	59
60	....	....	....	....	....	....	....	....	....	....	2	....	....	42	....	....	5	....	....	....	....	....	....	....	....	....	....	....	....	....	....	53	60
61	1	....	....	1	....	....	....	....	....	....	4	....	....	....	102	....	....	....	....	....	....	2	....	....	....	1	....	....	....	3	1	117	61
62	....	1	....	....	3	....	....	....	....	1	....	....	....	....	....	106	....	....	....	....	....	....	....	....	....	26	....	....	....	....	....	154	62
63	....	1	....	....	....	....	....	....	20	....	11	....	....	2	....	....	108	3	....	....	....	....	....	....	2	....	1	....	....	....	1	154	63
64	1	1	1	5	....	2	....	1	43	....	22	37	2	23	2	4	262	4	8	....	2	4	8	1	6	2	23	4	....	7	4	547	64
65	....	....	....	....	....	....	....	....	11	....	3	1	....	....	....	....	70	....	....	....	....	....	....	....	....	....	1	....	....	1	1	90	65
66	1	4	5	6	....	1	....	....	29	....	8	32	2	6	....	1	245	1	1	2	4	7	7	....	4	4	4	14	....	5	5	436	66
67	1	....	....	1	....	1	....	....	8	....	15	4	....	7	....	....	49	....	2	....	2	....	....	1	2	....	....	....	....	....	8	121	67
68	....	1	....	....	....	....	....	....	....	....	2	....	....	11	....	....	153	....	....	....	....	....	....	....	....	....	....	....	....	....	....	168	68
69	....	....	....	....	....	....	....	....	1	....	....	1	....	....	....	....	....	....	104	....	....	....	....	....	1	....	....	....	....	....	1	109	69
70	....	3	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	....	....	34	....	....	....	....	....	....	....	....	....	....	....	43	70
71	2	....	6	2	....	1	....	....	1	....	4	1	....	....	3	....	....	....	1	....	47	14	....	....	3	....	1	....	....	....	1	108	71
72	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	7	....	....	....	....	....	....	....	....	....	....	7	72
73	3	....	19	14	....	1	....	....	....	....	2	18	....	2	6	....	1	....	15	....	9	17	....	....	8	....	1	....	....	....	11	180	73
74	....	....	1	2	....	....	....	....	1	....	3	5	....	1	2	....	....	....	3	....	71	7	....	....	....	....	....	....	....	....	2	149	74
75	1	....	....	....	....	....	....	....	4	....	2	1	....	....	4	....	....	1	....	....	....	91	....	....	....	....	1	....	....	....	1	112	75
76	....	....	....	....	....	....	....	....	....	....	1	....	....	....	2	....	....	....	....	....	....	251	....	....	....	....	....	1	....	....	1	256	76
77	....	....	....	....	....	....	....	....	....	....	3	....	....	1	1	....	1	....	....	....	....	....	43	....	....	1	....	....	1	....	2	58	77
78	....	....	....	....	....	....	....	4	3	....	12	....	....	....	....	....	1	3	....	....	....	....	....	73	....	....	....	....	....	....	1	117	78
79	....	....	....	1	....	....	....	....	1	....	1	24	....	....	....	....	3	....	1	....	....	....	1	....	117	....	6	1	....	1	....	163	79
80	....	....	3	....	....	....	....	....	....	....	2	13	....	....	1	....	2	....	9	....	5	....	....	....	93	1	2	....	....	....	1	152	80
81	....	....	....	....	....	....	....	....	3	....	16	1	....	8	....	....	12	....	....	....	....	....	....	....	....	....	61	....	....	1	....	104	81
82	1	3	....	1	1	....	....	....	....	1	....	....	....	1	....	....	2	1	....	....	....	....	....	....	....	....	1	134	....	....	1	160	82
83	7	17	....	....	....	1	....	....	....	....	2	....	....	3	....	....	....	....	....	1	....	....	....	....	....	1	....	136	....	1	1	187	83
	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51		

Name of College	Enrolled During 1921-22					
	1st year	2d year	3d year	4th year	5th year	Totals
University of Alabama School of Med.*..	40	22	.....	.....	.....	62
University of Arkansas Medical Dept.*...	22	12	.....	.....	.....	34
College of Medical Evangelists.....	74	64	37	23	.....	198
Stanford University School of Medicine...	51	39	29	19	29	167
University of California Medical School..	57	54	44	42	36	233
University of Colorado School of Med. ..	39	22	24	15	.....	100
Yale University School of Medicine.....	55	47	40	23	.....	165
Georgetown University School of Med. ...	78	68	36	22	.....	204
George Washington University Med. Sch.	68	48	17	16	.....	149
Howard University School of Medicine...	99	45	31	24	.....	199
Emory University School of Medicine.....	60	56	53	51	.....	220
University of Georgia Medical Dept.	32	34	10	13	.....	89
Chicago Medical School.....	71	16	36	52	.....	175
Hahnemann Med. College of Chicago.—H.	34	36	27	13	.....	110
Loyola University School of Medicine....	84	54	24	33	36	231
Northwestern University Medical School..	107	87	94	87	76	451
Rush Medical College (Univ. of Chicago)	131	132	154	162	133	712
University of Illinois College of Med.	120	94	87	50	70	421
Indiana University School of Medicine....	112	66	61	35	.....	274
State University of Iowa College of Med.	137	81	55	40	.....	313
University of Kansas School of Medicine.	81	36	20	20	.....	157
University of Louisville Medical Dept.	62	51	29	21	.....	163
Tulane Univ. of Louisiana School of Med.	91	90	86	73	.....	340
Johns Hopkins University Medical Dept. ..	92	81	95	81	.....	349
University of Maryland School of Medicine and College of Phys. and Surgs...	118	65	60	56	.....	299
Boston University School of Medicine†....	54	58	25	24	.....	161
College of Phys. and Surgs., Boston.....	17	18	16	19	.....	70
Harvard University Medical School.....	125	121	123	102	.....	471
Tufts College Medical School.....	141	153	71	77	.....	442
Middlesex College of Med. and Surg.—N.‡	24	35	35	27	.....	121
University of Michigan Medical School....	224	150	111	73	.....	558
Univ. of Michigan Homeo. Med. Sch.—H.	18	13	22	8	.....	61
Detroit College of Medicine and Surgery..	75	42	26	23	.....	166
University of Minnesota Medical School..	95	90	66	46	102	399
University of Mississippi School of Med.*	29	25	.....	.....	.....	54
University of Missouri School of Med.*...	50	34	.....	.....	.....	84
Kansas City College of Med. & Surg.—N.†	30	26	20	14	.....	90
Kansas City Univ. of Phys. & Surgs.—N.	16	9	23	32	.....	80
St. Louis College of Physicians and Surgeons‡	13	19	28	60	.....	120
St. Louis University School of Medicine..	108	75	75	45	.....	303
Washington University School of Med. ..	71	60	55	49	.....	235
Creighton University College of Medicine.	42	39	36	21	.....	138
University of Nebraska College of Med. ..	98	63	69	24	.....	254
Dartmouth Medical School*.....	16	12	.....	.....	.....	28
Albany Medical College.....	31	30	15	12	.....	88
University of Buffalo Medical Dept.	75	62	52	23	.....	212
Columbia Univ. College of Phys. & Surgs.	103	91	92	70	.....	356
Cornell University Medical College.....	46	50	65	43	.....	213
Long Island College Hospital.....	111	54	98	48	.....	311
New York Homeopathic Medical College and Flower Hospital.—H.	57	42	18	19	.....	136
University and Bellevue Hosp. Med. Coll.	151	110	88	76	.....	425
Syracuse University College of Medicine..	52	42	36	35	.....	165
University of No. Carolina Sch. of Med.*	39	42	.....	.....	.....	81
Wake Forest College School of Med.*....	19	20	.....	.....	.....	39
University of No. Dakota Sch. of Med.*..	23	20	.....	.....	.....	43
Eclectic Medical College, Cincinnati.—E. ..	15	22	14	34	.....	85
University of Cincinnati College of Med.	50	48	62	47	.....	207
Western Reserve University Sch. of Med.	57	41	30	26	.....	154
Ohio State University College of Medicine	98	55	41	33	.....	227
Ohio State University College of Homeopathic Medicine.—H.	27	9	9	8	.....	53
University of Oklahoma School of Med. ..	45	33	24	15	.....	117
University of Oregon Medical School.....	66	48	29	11	.....	154
Hahnemann Medical College and Hospital of Philadelphia.—H.	56	54	30	17	.....	157
Jefferson Medical College of Philadelphia.	168	135	156	88	.....	547
Temple University School of Medicine....	36	9	21	24	.....	90
University of Pennsylvania Sch. of Med.	100	92	125	119	.....	436
Woman's Medical College of Pennsylvania	37	31	21	32	.....	121
University of Pittsburgh School of Med.	64	39	38	27	.....	168
Medical Coll. of the State of So. Carolina	42	28	26	13	.....	109
University of So. Dakota Coll. of Med.*..	30	13	.....	.....	.....	43
University of Tennessee College of Med. .	47	30	20	11	.....	108
University of W. Tennessee Med. Dept.‡..	.....	.....	3	4	.....	7
Meharry Medical College	29	51	66	34	.....	180
Vanderbilt University School of Medicine	48	50	38	13	.....	149
Baylor University College of Medicine....	42	27	19	24	.....	112
University of Texas School of Medicine..	94	76	44	42	.....	256
University of Utah School of Medicine*..	24	34	.....	.....	.....	58
University of Vermont College of Med. ..	46	33	22	16	.....	117
Medical College of Virginia.....	50	41	44	28	.....	163
University of Virginia Dept. of Medicine..	66	36	27	23	.....	153
West Virginia University School of Med.*	52	52	.....	.....	.....	104
University of Wisconsin Medical School*..	90	70	.....	.....	.....	160
Marquette University School of Medicine.	65	48	32	19	23	187
Totals for 1922.....	5412	4219	3355	2649	505	16140
Totals for 1921.....	4825	3588	2637	3416	406	14872
Totals for 1920.....	4234	2837	3464	3263	290	14088

E.—Eclectic; H.—Homeopathic; N.—Nondescript.
* Gives only the first two years of the medical course.
† Figures given are for 1920-21.
‡ Figures and distribution are approximate.

(*Continued from page 633*)

TUITION AND OTHER FEES

Attention is called in Table 1, on pages 630-632, to the amount charged by the various medical colleges per annum for tuition, matriculation, and laboratory and graduation fees for each student. In Table 10, the eighty-three colleges have been grouped according to the amount of fees charged and according to their classification by the Council on Medical Education and Hospitals. Thirteen colleges charge fees of $125 or less per year; thirty-eight between $125 and $225; twenty-four between $225 and $325, and six charge above $325. Of the thirteen colleges charging $125 or less eleven (78.6 per cent.) are listed among Class A (acceptable) colleges [2] by the Council on Medical Education, while two are in Class C. The eleven Class A colleges having these low fees include the schools of medicine of the state universities of Arkansas, Georgia, Missouri, Oklahoma, North Dakota, South Dakota, Texas and West Virginia—for residents of those states. On the other hand, five colleges listed by the Council in Class C charge fees of $175 to $225 per year. Diplomas from Class C colleges are reported as not recognized by from forty-two to forty-seven state licensing boards.[3] No intelligent student would knowingly spend his time and money in a low-grade college, the diplomas of which are not recognized by many states, when in the same time, and for even less money, he could attend some of the best-equipped colleges, the diplomas of which are recognized everywhere. Although forty-two colleges listed in Class A charge fees ranging from $175 to $350 per year for each student, the actual expense for teaching that student for the year in these colleges is much more than the fee charged. This larger expenditure is possible because the colleges receive either state aid or private endowment. This shows that no medical college can properly teach medicine on the income received from fees alone. Although during the last few years fees have been increased, this in no way compares with the greatly increased cost of furnishing a medical education. Although fees have been moderately advanced, at the same time, greater

TABLE 10.—COLLEGE FEES

Total Fees	Number of Colleges			
	Class A	Class B	Class C	Total
$ 75 or less.....	6	..	..	6
75 to $125.....	5	..	2	7
125 to 175.....	15	3	1	19
175 to 225.....	13	2	4	19
225 to 275.....	14	..	..	14
275 to 325.....	9	1	..	10
Above 325.....	6	..	..	6
Totals.....	68	6	7	81

2. See classification on page 642.
3. See THE JOURNAL A. M. A., April 29, 1922, p. 1306, Table D.

provision has been made for scholarships and loan funds (see page 638) for benefit of deserving students who are financially poor.

COLLEGES, STUDENTS AND GRADUATES BY STATES

Illinois formerly had the largest number of medical colleges (Table 11), but for the last four years the first place has been held by New York, where there are

TABLE 11.—MEDICAL COLLEGES, STUDENTS AND GRADUATES BY STATES

State	Colleges		Students		Graduates		Graduates with B.S. or A.B.
	Class A and B	Class C	Men	Women	Men	Women	
Alabama	1	....	62	....	....	....	....
Arkansas	1	....	33	1	....	....	....
California	3	....	489	109	83	9	88
Colorado	1	....	91	9	15	....	11
Connecticut	1	....	156	9	21	2	16
Dist. of Columbia	3	....	540	12	59	....	29
Georgia	2	....	308	1	63	....	28
Illinois	5	1	1,965	135	375	15	226
Indiana	1	....	260	14	33	....	33
Iowa	1	....	301	12	35	3	23
Kansas	1	....	147	10	22	2	21
Kentucky	1	....	158	5	21	....	8
Louisiana	1	....	327	13	66	5	30
Maryland	2	....	594	54	122	13	110
Massachusetts	3	2	1,212	53	255	10	100
Michigan	2	....	742	43	91	7	37
Minnesota	1	....	368	31	77	3	79
Mississippi	1	....	52	2	....	....	....
Missouri	3	3	882	30	164	5	51
Nebraska	2	....	377	15	36	1	20
New Hampshire	1	....	28	....	....	....	....
New York	8	....	1,766	140	305	21	210
North Carolina	2	....	119	1	....	....	....
North Dakota	1	....	42	1	....	....	....
Ohio	4	....	691	35	144	5	92
Oklahoma	1	....	114	3	15	....	13
Oregon	1	....	138	16	7	3	7
Pennsylvania	6	....	1,356	163	261	39	128
South Carolina	1	....	104	5	12	1	2
South Dakota	1	....	43	....	....	....	....
Tennessee	3	1	438	6	56	....	24
Texas	2	....	348	20	59	6	24
Utah	1	....	57	1	....	....	....
Vermont	1	....	114	3	16	....	6
Virginia	2	....	294	21	44	3	20
West Virginia	1	....	102	2	....	....	....
Wisconsin	2	....	333	14	18	1	19
Totals	74	7	15,151	989	2,375	154	1,455

still eight colleges. Illinois, Missouri and Pennsylvania have six colleges each; Massachusetts has five, and Tennessee has four. Of Class C colleges, however, Missouri has three, Massachusetts has two, and there is one each in Illinois and Tennessee. In Missouri the Class C colleges exist because that board does not have or does not exert the power to have their charters revoked.

For the last four years New York has had the largest number of students enrolled. This year Illinois has 2,100, followed by New York with 1,906 and Pennsylvania with 1,519. Illinois leads also in the number of graduates, having reported 390, followed by New York with 326, Pennsylvania with 300, Massachusetts with 265 and Missouri with 169.

QUALIFICATIONS OF STUDENTS AND GRADUATES

Table 12 shows the students and graduates of the last seven years grouped according to their classification by the Council on Medical Education and Hospitals. Note that during the nine years the percentage of students enrolled in Class A colleges has increased from 65.4 to 90.6, and that since 1917 the total number of students in attendance at these schools has increased from 11,317 to 14,625. Note, on the other hand, that both the numbers and the percentages of students enrolled in Class B and Class C colleges have been reduced. The percentage of students in Class B colleges has been reduced from 24.4 to 5.3 and in Class C colleges from 10.2 to 4.1. Of graduates, also, the percentage in Class A colleges shows an increase, while in Class B and Class C colleges there has been a decrease except for a slight increase this year in Class C colleges. Such reductions as there have been in the total number of students and graduates, therefore, have been largely at the expense of the lower grade colleges, while the numbers of students and graduates in the better colleges have been increased.

HINTS TO PROSPECTIVE MEDICAL STUDENTS

The student who is contemplating the study of medicine should read with care the instructions entitled "Choice of a Medical School" beginning on page 638. The selection of the school in which he is to obtain his medical training is a matter of extreme importance and should be considered by the student with special care. He should note the standards of premedical education which are given on page 639, he should note the subjects required by the individual medical schools which, if different from those outlined by the Council on Medical Education and Hospitals, will be found in the descriptive statements of those colleges appearing on pages 649 to 658. A careful review of the material published this week will be of great service to such students.

GRADUATE MEDICAL EDUCATION

The facilities for graduate medical instruction in the United States are set forth on the next few pages. Not only are the separate graduate medical schools given, but also the opportunities available in undergraduate medical schools. In the latter, the courses

TABLE 12.—STUDENTS AND GRADUATES ACCORDING TO CLASSIFICATION

Year	Students						Graduates					
	Colleges Rated in Class						Colleges Rated in Class					
	A	%	B	%	C	%	A	%	B	%	C	%
1913	11,122	65.4	4,158	24.4	1,735	10.2	2,539	63.8	1,050	26.4	392	9.8
1914	12,336	74.7	2,838	17.2	1,328	8.1	2,626	73.1	686	19.1	282	7.8
1915	11,314	76.0	2,668	17.9	909	6.1	2,629	74.4	688	19.4	219	6.2
1916	11,162	79.6	2,087	14.9	773	5.5	2,630	74.7	695	19.8	193	5.5
1917	11,317	82.2	1,761	12.8	686	5.0	2,577	76.3	648	19.2	154	4.5
1918	11,522	84.5	1,488	10.9	620	4.5	2,024	75.8	399	14.9	247	9.2
1919	11,466	87.9	1,086	8.3	500	3.8	2,220	83.6	268	10.1	168	6.3
1920	12,610	89.6	680	4.8	798	5.6	2,690	88.4	152	5.0	205	6.6
1921	13,487	90.5	832	5.6	553	3.9	2,812	88.1	200	6.3	180	5.6
1922	14,625	90.6	852	5.3	663	4.1	2,204	87.1	143	5.7	182	7.2

vary somewhat from year to year, but the outlines given indicate the variety and extent of such work, It is hoped that by the publication each year of these data opportunities in undergraduate schools may be enlarged and a greater use be made of the abundance of clinical material in this country. The majority of undergraduate medical schools are now on a par with those in other leading countries; their future develop-

ment need not be hindered by providing also for the giving of graduate courses.

FOREIGN MEDICAL SCHOOLS

One pages 644 to 646 will be found a complete list of medical schools in foreign countries. Altogether, it will be noted that there are 270 in all other countries where, at the present time, there are eighty-one in the United States. In 1906 there were 154 in all other countries whereas the United States had 162. In 1906 the educational standards of medical schools in the United States, with a few exceptions, were quite low as compared with those in leading nations abroad. At the present time, however, the standards of seventy-four of the eighty-one medical schools are practically on a par with the educational standards abroad, and some of the medical schools here now exceed many of those abroad in entrance requirements, if not also in endowments, buildings and equipment.

Scholarships in Medical Schools

As evidence that provision is being made for worthy students, regardless of their financial status, 534 scholarships are reported this year in the following forty-six medical schools:

University of Alabama School of Medicine, Tuscaloosa	67
Stanford University Medical School,* San Francisco	2
University of California Medical School,* San Francisco	6
University of Colorado School of Medicine,* Denver	1
Yale University School of Medicine,* New Haven	2
Georgetown University School of Medicine, Washington	2
Emory University Medical School,* Atlanta	11
Northwestern University School of Medicine,* Chicago	1
Rush Medical College, Chicago	7
University of Illinois College of Medicine, Chicago	84
Indiana University School of Medicine,* Bloomington and Indianapolis	12
State University of Iowa College of Medicine, Iowa City	1
University of Kansas School of Medicine,* Kansas City	1
Johns Hopkins University Medical Department, Baltimore	6
University of Maryland School of Medicine and College of Physicians and Surgeons, Baltimore	8
Boston University School of Medicine,* Boston	16
Medical School of Harvard University,* Boston	50
Detroit College of Medicine and Surgery, Detroit	8
University of Missouri School of Medicine,* Columbia	10
Washington University School of Medicine, St. Louis	2
University of Nebraska College of Medicine,* Omaha	6
Dartmouth Medical School,* Hanover, N. H.	2
Albany Medical College, Albany, N. Y.	11
University of Buffalo Department of Medicine,* Buffalo	1
Columbia University College of Physicians and Surgeons, New York	36
Cornell University Medical College,* New York	3
Syracuse University College of Medicine, Syracuse	1
University and Bellevue Hospital Medical College,* New York	1
University of North Carolina School of Medicine, Chapel Hill	1
University of Cincinnati College of Medicine,* Cincinnati	12
University of Oregon Department of Medicine,* Portland	5
Hahnemann Medical College and Hospital of Philadelphia*	12
Jefferson Medical College, Philadelphia	3
Temple University Department of Medicine, Philadelphia	3
University of Pennsylvania School of Medicine,* Philadelphia	4
University of Pittsburgh School of Medicine, Pittsburgh	3
Woman's Medical College of Pennsylvania,* Philadelphia	30
Medical College of the State of South Carolina, Charleston	8
University of Tennessee College of Medicine, Memphis	15
Vanderbilt University Medical Department, Nashville, Tenn.	4
University of Texas Department of Medicine,* Galveston	2
University of Vermont Medical School*	55
Medical College of Virginia, Richmond	10
University of Virginia Department of Medicine,* Charlottesville	2
West Virginia University School of Medicine,* Morgantown	1
University of Wisconsin Medical School, Madison	6
Total in 46 medical schools	534

* Have loan funds also.

Loan Funds

Besides the twenty-four colleges marked by an asterisk (*) in the above list which have loan funds for deserving but needy students, such funds are available also at the five following medical schools:

College of Medical Evangelists, Loma Linda, Calif.
Tulane University of Louisiana School of Medicine, New Orleans.
University of Michigan Medical School, Ann Arbor.
Wake Forest College School of Medicine, Wake Forest, N. C.
University of North Dakota School of Medicine, University.

CHOICE OF A MEDICAL SCHOOL

For the student who has decided to study medicine the first and most important step is the selection of a medical school; a false step here may handicap him for life.

Before choosing a medical school the student should obtain information in regard to its requirements of preliminary education; the character of its teaching; its classification; the tuition fees charged and—most important—whether or not its diplomas are recognized by all state medical boards.

ADEQUATE ENTRANCE QUALIFICATIONS

The student should make sure that his preliminary education is sufficient to meet the requirements of the state licensing boards of the country. He should know that at the present time thirty-eight[1] state licensing boards (73 per cent.) require that before beginning the study of medicine the student must have completed *two years* of work in an approved college of liberal arts, in addition to a four-year high school education.[2] Although he may not at first seek a license in one of these thirty-five states, he may later miss a great opportunity by being thus debarred. He should know also that all the better medical colleges now require this higher preliminary education, since—most important of all—the student needs it to understand and master the difficult and complex subjects of the modern medical college course. Lower entrance requirements by any medical college, therefore, should be regarded as an indication that the medical training furnished will be correspondingly low.

BETTER MEDICAL TRAINING ESSENTIAL

Medicine is now based on scientific knowledge, without which any physician will be seriously handicapped. Adequate instruction in the recognition, treatment and prevention of diseases can be given only in acceptable (Class A) medical schools, which have expert teachers, well-equipped laboratories, and dispensaries and hospitals where the student at the bedside can study patients having all varieties of sickness and injuries.

IS THE MEDICAL COLLEGE RECOGNIZED?

Formerly a course in almost any medical college furnished an adequate qualification for the license to practice medicine in all states. At present, however, state licensing boards are refusing to recognize medical colleges which are deemed not properly equipped to furnish a training in modern medicine. The student should know that the diplomas granted by some medical schools are not recognized in as high as from 40 to 46 states.[3] A diploma from one of these medical colleges, therefore, would not qualify him to practice medicine in any of those states. The student must make sure, not only that he has adequate preliminary education, but also that he has secured his medical training in a college recognized in all states.

CONSIDER CAREFULLY THE COST

The student, of course, is bound to consider the expense of his medical training, and herein lies the bait by which some inferior colleges which profess deep interest in "the poor boy" endeavor to attract students. If the training is not thorough and up to date, the student should know that the training furnished will be a mighty poor investment at any price. As a matter of fact, and as may be noted in Table 1, (opp. p. 23), the total fees charged by some of the best (Class A) medical colleges, particularly the medical departments of some state universities, are lower than those charged by some of the poorly equipped (Class C) institutions which are not recognized by the majority of state licensing boards.

In the same length of time, therefore, and often for even lower fees than he would pay in a poorly equipped institution, the student may acquire his education in one of the best medical colleges of the land. Although some of the better schools do charge higher fees, they spend on each student per year several times the amount of money that the student pays for tuition. This they are able to do because of their larger incomes from endowments or state aid. It would be poor

1. These states are listed on page 658.
2. The courses required and recommended in the high school and two-year premedical college courses are set forth on pages 639-640.
3. See J. A. M. A. **78**: 1306 (April 29) 1922.

economy, therefore, for a student to enter a low-grade college whose diplomas are not recognized in the majority of states, when for a few additional dollars each year he can enter a thoroughly equipped institution, receive a far better medical training and obtain a diploma recognized everywhere. Even if one should be required to work one's way through, in whole or in part, the opportunities for doing so are usually more abundant in the better than in the lower standard colleges. As a rule, however, the student who works his way through college appreciates not only the value of money, but also the value of the medical course he is getting, and many such students are found in the high-grade medical colleges. There are now more than 300 free scholarships, as well as generous loan funds, available for deserving students in the better medical colleges.[4]

GET RELIABLE INFORMATION

How may the student secure reliable information on these matters? Some medical colleges advertise extensively in newspapers and popular magazines and through announcements and circulars containing exaggerated, if not misleading, statements. *Of course, such advertisements do not show the more important fact that their diplomas are reported as not recognized in from 40 to 46 states.* It is essential, therefore, that the student should secure information from impartial and reliable sources, so as to make sure he is not enticed into a low-grade institution. To inform himself thoroughly, therefore, he should not depend alone on the announcements of the medical schools. After extensive and repeated investigations the medical schools of the country have been rated by the Council in three classes, namely, A, B and C, according to their degree of excellence.[5] If the student is otherwise in doubt, he will not make a mistake by choosing one of the colleges in Class A. By so doing he will not only obtain a better training in medicine but also, after graduation, will be eligible to secure a license in any state he may choose.

A STRONG AND SURE FOUNDATION

In his preliminary and medical education the student should bear in mind that he is *laying the foundation for the rest of his life.* If he finds that additional preliminary education is needed to enter one of the better medical colleges, he should consider the time well spent, since he is all the more sure of having laid a solid foundation. Although all professions in this country are crowded, there is always room for the thoroughly competent. On the other hand, the student will be disappointed if, because of lower entrance requirements or other allurements, he is induced to get his training in a poorly equipped college and finds after graduation that his diploma is not recognized in many states, and that otherwise he is handicapped for life.

AVOID CULTS AND FADS

Among the worst pitfalls confronting the present day student is the number of institutions representing various unscientific, or pseudo-scientific cults, such as osteopathy, chiropractic, etc., which profess to train those who desire to treat human ailments.[6] Medical knowledge is now based on scientific facts and there is no longer room for the differences of opinion which in earlier days were justifiable. One medical schools are now the medical departments of universities of long established reputation—the best evidence that medicine as taught in medical schools is recognized as reliable. The theories advanced by osteopaths, chiropractors and other unscientific fads, however, have received no such endorsements and there is no acceptable proof of their having a reliable foundation. No one can afford to confine his training to the narrow theories held by any cult but should obtain a thorough, all-around scientific training by which he will be prepared to care intelligently for any form of human ailment or disorder which presents itself and to apply skilfully any form of treatment which each particular patient may require. One must have a thorough training in *all the fundamentals of medicine* before he can intelligently employ any particular method of treatment, even as the member of an orchestra must have a thorough training in all the fundamentals of music before he can play any particular instrument in that orchestra. One must first become a good general practitioner of medicine; then if he wishes to specialize along any particular line he will naturally secure further training for such specialty.

4. A list of colleges which provide scholarships and loan funds appears on page 638.

5. See classification on page 642.

6. Special pamphlets, bearing on the various pseudo-medical or so-called "drugless" cults, will be furnished on application.

ESSENTIALS OF AN ACCEPTABLE MEDICAL COLLEGE

1. The minimum requirement for admission to an acceptable medical college is a four-year high school education or its full equivalent and two years of work in a college of arts and sciences approved by the Council on Medical Education and Hospitals, as follows:

I. High School Requirements

(*a*) For admission to the two-year premedical college course, students shall have completed a four-year course of at least fifteen units in a standard accredited high school or other institution of standard secondary school grade, or have the equivalent as demonstrated by examinations conducted by the College Entrance Examination Board, or by the authorized examiner of a standard college or university approved by the Council on Medical Education and Hospitals. A detailed statement of attendance at the secondary school, and a transcript of the student's work, should be kept on file by the college authorities. This evidence of actual attendance at the secondary schools should be obtained, no matter whether the student is admitted to the freshman or to higher classes.

SCHEDULE OF SUBJECTS REQUIRED OR ACCEPTED FOR ENTRANCE TO THE PREMEDICAL COLLEGE COURSE

Subjects	Units *	Required
GROUP I, ENGLISH—		
Literature and composition	3-4	3
GROUP II, FOREIGN LANGUAGES—		
Latin	1-4	
Greek	1-3	
French or German	1-4	2†
Other foreign languages	1-4	
GROUP III, MATHEMATICS—		
Elementary algebra	1	1
Advanced algebra	½-1	..
Plane geometry	1	1
Solid geometry	½	..
Trigonometry	½	..
GROUP IV, HISTORY—		
Ancient history	½-1	
Medieval and modern history	½-1	
English history	½-1	1
American history	½-1	
Civil government	½-1	
GROUP V, SCIENCE—		
Botany	½-1	..
Zoology	½1-	..
Chemistry	1	..
Physics	1	..
Physiography	½-1	..
Physiology	½-1	..
Astronomy	½	..
Geology	½-1	..
GROUP VI, MISCELLANEOUS—		
Agriculture	1-2	..
Bookkeeping	½-1	..
Business law	½	..
Commercial geography	½-1	..
Domestic science	1-2	..
Drawing, freehand and mechanical	½-2	..
Economics and economic history	½-1	..
Manual training	1-2	..
Music: Appreciation or harmony	1-2	..

* A unit is the credit value of at least thirty-six weeks' work of four or five recitation periods per week, each recitation period to be not less than forty minutes. In other words a unit represents a year's study in any subject in a secondary school constituting approximately a quarter of a full year's work. A satisfactory year's work in any subject cannot be accomplished under ordinary circumstances in less than 120 sixty-minute hours, or their equivalent.

† Both of the required units of foreign language must be of the same language, but the two units may be presented in any one of the languages specified.

Of the fifteen units of high school work, eight units are required, as indicated in the foregoing schedule; the remainder may be made up from any of the other subjects in the schedule.

(*b*) Credits for admission to the premedical college course may be granted for the subjects shown in the accompanying

list and for any other subject counted by a standard accredited high school as a part of the requirements for its diploma, provided that at least eleven units must be offered in Groups I-V.

II. Premedical College Course

(*c*) The minimum requirement for admission to acceptable medical schools, in addition to the high school work specified above, will be sixty semester hours of collegiate work, extending through two years, of thirty-two weeks each, exclusive of holidays, in a college approved by the Council on Medical Education and Hospitals. The subjects included in the two years of college work should be in accordance with the following schedule:

SCHEDULE OF SUBJECTS OF THE TWO-YEAR PREMEDICAL COLLEGE COURSE

Sixty Semester Hours* Required

Required Subjects:	Semester Hours
Chemistry (a)	12
Physics (b)	8
Biology (c)	8
English composition and literature (d)	6
Other nonscience subjects (e)	12
Subjects Strongly Urged:	
A modern foreign language (f)	6-12
Advanced botany or advanced zoology	3- 6
Psychology and logic	3- 6
Advanced mathematics, including algebra and trigonometry	3- 6
Additional courses in chemistry	3- 6
Other Suggested Electives:	
English (additional), economics, history, sociology, political science, mathematics, Latin, Greek, drawing.	

* A semester hour is the credit value of sixteen weeks' work consisting of one lecture or recitation period per week, each period to be not less than fifty minutes net, at least two hours of laboratory work to be considered as the equivalent of one lecture or recitation period.

SUGGESTIONS REGARDING INDIVIDUAL SUBJECTS

(*a*) *Chemistry.*—Twelve semester hours required of which at least eight semester hours must be in general inorganic chemistry, including four semester hours of laboratory work and four semester hours in organic chemistry, including two semester hours of laboratory work. In the interpretation of this rule, work in qualitative analysis may be counted as general inorganic chemistry.

(*b*) *Physics.*—Eight semester hours required, of which at least two must be laboratory work. It is urged that this course be preceded by a course in trigonometry.

(*c*) *Biology.*—Eight semester hours required, of which four must consist of laboratory work. This requirement may be satisfied by a course of eight semester hours in either general biology or zoology, or by courses of four semester hours each in zoology and botany, but not by botany alone.

(*d*) *English Composition and Literature.*—The usual introductory college course of six semester hours, or its equivalent, is required.

(*e*) *Nonscience Subjects.*—Of the sixty semester hours required as the measurement of two years of college work, at least eighteen, including the six semester hours of English, should be in subjects other than the physical, chemical or biologic sciences.

(*f*) *Foreign Language.*—A reading knowledge of a modern foreign language is strongly urged. French and German have the closest bearing on modern medical literature. If the reading knowledge in one of these languages is obtained on the basis of high school work, the student is urged to take the other language in his college course. It is not considered advisable, however, to spend more than twelve of the required sixty semester hours on foreign languages.

Recognition.—This two-year premedical course in both quantity and quality must be such as to make it acceptable as the equivalent of the first two years of the course in reputable, approved colleges of arts and sciences leading to the degree of Bachelor of Science.

APPROVED COLLEGES OF ARTS AND SCIENCES

A tentative list of colleges of arts and sciences approved by the Council on Medical Education and Hospitals has been prepared, and will be occasionally revised. By an approved college (of arts and sciences) is meant one whose standing has been vouched for by some standardizing agency in whose methods the Council has confidence.

PREMEDICAL COURSES IN MEDICAL COLLEGES—JUNIOR COLLEGES

Premedical college courses given in or by medical schools, by normal schools, or advance years taken in high schools, will not be considered as acceptable unless they have been investigated and approved by some association of colleges and secondary schools or other approved agency having to do with the standardizing of liberal arts colleges, and unless they are found to be a full equivalent of the first two years of the course leading to the Bachelor of Science degree.

III. The Medical School

ADMINISTRATION OF ENTRANCE REQUIREMENTS

2. The admission of students to the medical school must be in the hands of a responsible committee or examiner whose records shall always be open for inspection. Documentary evidence of the student's preliminary education should be obtained and kept on file. When the medical school is an integral part of the university, this work usually devolves on the university examiner. Unless the university examiner and his records are closely accessible, however, some officer at the medical school should obtain and keep on file documentary evidence of each student's preliminary education, including both high school and collegiate work. The records should show especially that the required amount of work in the premedical sciences, including laboratory experiments, has been completed.

OTHER MEDICAL SCHOOL REQUIREMENTS

3. The college should require that students be in actual attendance in the college *within the first week* of each annual session and thereafter.

4. Actual attendance at classes should be insisted on except for good cause, such as for sickness, and no credit should be given for any course when the attendance has been less than 80 per cent. of the full time.

5. (*a*) Full advanced standing may be granted to students only for work done in other acceptable medical schools, and in granting advanced standing there should be no discrimination against the college's full-course students. Official verification of the student's previous medical work should be obtained by direct correspondence with the college previously attended, and his preliminary qualifications should also be verified and recorded the same as for freshman students. (*b*) In *exceptional cases* students who possess the required premedical qualifications and who have completed three or more years of work in Class B medical schools may be given advanced standing but not higher than *entrance* to the third year (junior) class, and no credit should be given in any subject except on recommendation of the head of the department teaching that subject. (*c*) In *exceptional cases* also students who possess the required premedical qualifications and who have completed three or more years of work in Class C colleges may be given advanced standing but not higher than *entrance* to the second year (sophomore) class, and then only after thorough examinations in all first year subjects have been passed.

SUPERVISION, EQUIPMENT, TEACHERS

6. There should be careful and intelligent supervision of the entire school by the dean or other executive officer who holds, and has sufficient authority to carry out fair ideals of medical education as determined by the present day knowledge of medicine.

7. There should be a good system of records showing conveniently and in detail the credentials, attendance, grades and accounts of the students, by means of which an exact knowledge can be obtained regarding each student's work. Records should also be kept showing readily the attendance of patients at the teaching hospitals and dispensaries; the maternity cases attended by students, and the postmortem cases used in teaching.

8. The college curriculum should be fully graded and should cover four sessions of at least thirty-two weeks each, exclusive of time required for matriculation and holidays, and at least thirty hours per week of actual work. The courses offered in the various subjects should be set forth by departments (anatomy, physiology, etc.) in the annual announcement, showing for each course its number, subject, content, character (lecture, recitation, laboratory or clinic), length of time, when, where, and by whom given, and the amount of credit allowed. The courses for each class should also be clearly set forth in a printed class schedule, for the guidance of the students.

(*a*) The college should give two years of work consisting largely of laboratory work in well equipped laboratories of anatomy, histology, embryology, physiology, physiologic chemistry, bacteriology, pathology, pharmacology, therapeutics and clinical diagnosis. Present-day medical knowledge makes it essential that these subjects be in charge of full-time, well-trained teachers.

(*b*) Two years of clinical work, largely in hospitals and dispensaries, with courses in medicine (including physical diagnosis, pediatrics, nervous and mental diseases), surgery (including surgical anatomy and operative surgery on the cadaver), obstetrics, gynecology, laryngology, rhinology, ophthalmology, otology, dermatology, hygiene and medical jurisprudence. With the higher entrance requirements time is now available in the latter part of the second year for beginning courses in physical diagnosis and the principles of surgery.

(*c*) As soon as conditions warrant, relations should be established with a number of approved hospitals so that a fifth undergraduate year may be required to be spent by the student as an intern under the continued supervision of the medical school.

FACULTY

9. (*a*) The college should provide at least *eight expert thoroughly trained professors in the laboratory branches,* salaried so that they may devote their entire time to instruction and to that research without which they cannot well keep up with the rapid progress being made in their subjects.[7] For colleges having *sixty students or less* in each class, there should be at least one full-time salaried assistant each in the departments of (1) anatomy, (2) physiology, (3) pathology and bacteriology, and (4) physiologic chemistry and pharmacology. There should be also one additional assistant provided in each of these departments for *each additional thirty students enrolled.* This represents a low average of the full-time assistants already employed by the acceptable medical colleges.

(*b*) The faculty should be made up of graduates of institutions recognized as medical colleges who have had a training in all departments of medicine. Nonmedical men should be selected as teachers in medical schools only under exceptional circumstances and only when medical men of equal special capacity are not available. The faculty should be organized, each department having its head professor, its associate professor, assistant professor, instructor, etc., each having his particular subjects for the teaching of which he is responsible to the head of the department.

CLINICAL FACILITIES AND INSTRUCTION

10. (*a*) The college should own or entirely control a hospital in order that students may come into close and extended contact with patients under the supervision of the attending staff. This hospital should be in close proximity to the college and have a daily average (for senior classes of 100 students or *less*) of not less than 200 patients who can be utilized for clinical teaching, these patients to be of such character as to permit the students to see and study the common variety of surgical and medical cases as well as a fair number in each of the so-called specialties. In the use of this material *bedside and ward clinics* should be developed for sections of from five to ten students, and for the seniors, a certain number of patients in medicine, surgery and the specialties should be assigned to each student under a well supervised clinical clerk system. The treatment and care of these patients should be particularly observed and recorded by the student under the strict supervision of the intern, or the attending staff of the hospital.

(*b*) The college should also have ample hospital facilities for children's diseases, contagious diseases and nervous and mental diseases.

(*c*) The college should own or control a dispensary, or outpatient department, the attendance to be a daily average of 100 patients (visits) (for senior classes of 100 students *or less*), the patients to be carefully classified, good histories and records of the patients to be kept and the material to be well used. The attending staff should be made up of good teachers, and should be well organized and be prompt and regular in attendance.

(*d*) At least six maternity cases should be provided for each senior student, who should have actual charge of these cases under the supervision of the attending physician. Careful records of each case should be handed in by the student.

(*e*) Facilities should be provided for at least thirty necropsies (for senior classes of 100 students *or less*) during each college session which are attended and participated in by senior students. These, as a rule, should be in the teaching hospital controlled by the medical school and performed by the professor of pathology. The so-called clinical-pathologic conferences should be more widely developed in connection with the postmortems.

OTHER TEACHING FACILITIES AND FINANCES

11. The college should have a working medical library, to include the more modern text and reference books with the *Index Medicus,* the Surgeon-General's Index and other serviceable indexes. The library should receive regularly thirty or more leading medical periodicals, the current numbers of which should be in racks or on tables easily accessible to the students. At the end of each year these periodicals should be bound and added to the files of bound periodicals. The library room should be properly lighted and heated, and open during all or the greater part of the day; it should be equipped with suitable card indexes as well as with tables and chairs, and have a competent librarian in charge.

12. There should be a working medical museum having its various anatomic, embryologic, pathologic and other specimens carefully prepared, labeled and indexed so that any specimen may be easily found and employed for teaching purposes. It is suggested that so far as possible with each pathologic specimen coming from postmortems there also be kept the record of the postmortem, the clinical history of the patient on whom the necropsy was held and microscopic slides showing the minute structures of the disease shown in the gross specimen. The museum furnishes an excellent means of correlating the work of the department of pathology with that of the clinical departments.

13. There should be sufficient dissecting material to enable each student individually to dissect at least the lateral half of the human cadaver, to provide cross-sections and other demonstration material and to allow of a thorough course for each senior in operative surgery on the cadaver.

14. For modern experimental laboratory work in physiology, pharmacology and bacteriology as well as for medical research, a supply of animals—frogs, turtles, rabbits and guinea-pigs, if not also cats and dogs—is essential. Proper provision, also, is necessary for the housing and care of such animals. In any use made of animals every precaution should be taken to prevent needless suffering, and work by students should be carefully supervised.

15. Each college should have a supply of such useful auxiliary apparatus as a stereopticon, a reflectoscope, carefully

7. These professors should have a definite responsibility in the conduct of the college, and their first and chief interest should be the training of medical students. It is suggested that four of these professors be placed at the head of the departments of (*a*) anatomy, (*b*) physiology and physiologic chemistry, (*c*) pathology and bacteriology, and (*d*) pharmacology and therapeutics. The other four might with advantage be assigned, one each, to (*e*) histology and embryology, under the department of anatomy, and to the department of (*f*) pathology and bacteriology, and (*g*) physiology and pharmacology, and to the departments of (*h*) either internal medicine or surgery.

prepared charts, embryologic or other models, manikins; dummies for use in bandaging, a roentgen-ray and other apparatus now so generally used in medical teaching.

16. The college should show evidences of thorough organization and of reasonably modern methods in all departments, and evidences that the equipment and facilities are *being intelligently used* in the training of medical students.

17. A clear statement of the college's requirements for admission, tuition, time of attendance on the classes, sessions, courses offered and graduation should be clearly set forth, together with complete classified lists of its matriculants and latest graduating class in regular annual catalogues or announcements.

18. Statistics show[8] that modern medicine cannot be acceptably taught by a medical school depending solely on the income from students' fees. No medical school should expect to secure admission to, or be retained in Class A, therefore, which does not have an annual income of at least $25,000 in addition to the amount obtained from students' fees.

IV. Classification of Medical Colleges

Revised to Aug. 15, 1922

SCHEDULE FOR GRADING MEDICAL SCHOOLS

After careful inspection, medical schools are rated on a civil service basis on a scale of 100 points. Data relating to each school will be grouped under four general heads in such manner that the groups will have as nearly equal importance as possible, each group being allowed a possible 25 points. The revised schedule under the four general heads is as follows:

1. FACULTY.—Number; qualifications (standing in profession, evidences of special training, teaching experience, etc.); research ability; efficiency; proportion of time to teaching; proportion to student enrolment; organization of departments; completeness of department staffs, including dieners, employees, etc.; esprit de corps.

2. PRODUCT.—Qualifications of students admitted; student organizations; esprit de corps; records of graduates before state and national boards; research; articles written; excellence as teachers; membership in medical organizations; reputation in profession; other evidences of character of training; reputation of college.

3. ADMINISTRATION AND SUPERVISION.—Curriculum: grade of course; sequence of subjects; arrangement of subjects in class roster and by departments in annual announcements; completeness of curriculum. Division of students in sections, ward classes, etc. Efficiency of routine. Faculty meetings. Supervision of entrance requirements, of teaching in college and in dispensary and hospital. Records: entrance requirements; class grades; promotion of students; dispensary and hospital records; attendance of teachers and students; conditions, etc.; completeness. Budget: use made of funds; proportion to salaries, etc.

4. BUILDINGS AND EQUIPMENT.—College building, including class rooms, laboratories, library, museum, storage rooms, animal houses and their contents. Dispensary: rooms used for; accessibility; number and regularity of staff; quantity and use of clinical material; character of histories and records. Hospital: accessibility; ownership or control; quantity, variety and use of clinical material. Other equipment. Apparatus. Funds: in addition to students' fees; endowed chairs, fellowships, etc.

Medical schools obtaining 70 per cent. or above are rated in Class A, those obtaining from 50 to 70 per cent. in Class B, and those obtaining 50 per cent. or less in Class C.

MEANING OF CLASSES A, B AND C

Class A Colleges are those which are acceptable; Class B, those which, under their present organization, give promise of being made acceptable by general improvements, and Class C those

(*a*) Which require a complete reorganization to make them acceptable.

(*b*) Which do not keep satisfactory records of their students in regard to entrance requirements, attendance, grades in courses, division into classes and reasons for promotion.

(*c*) Which do not enforce their requirements in regard to admission (including those admitted to advanced standing), promotion and graduation.

(*d*) Which give the major portion of their instruction after 4 o'clock in the afternoon.

(*e*) Which are privately owned and conducted for profit.

(*f*) Which for other specific reasons are not eligible for inclusion in Class B.

8. See "Medical College Finances," J. A. M. A., April 8, 1916, p. 1115.

CLASS A—ACCEPTABLE MEDICAL COLLEGES

ALABAMA

University of Ala. School of Med.*..University (Tuscaloosa)

ARKANSAS

University of Arkansas Medical Department[1]....Little Rock

CALIFORNIA

Stanford Univ. School of Med.....San Francisco
University of California Medical School.....San Francisco

COLORADO

University of Colorado School of Med.....Boulder-Denver

CONNECTICUT

Yale University School of Medicine.....New Haven

DISTRICT OF COLUMBIA

Georgetown University School of Medicine.....Washington
George Washington University Medical School..Washington
Howard University School of Medicine[2].....Washington

GEORGIA

Emory University School of Medicine[3].....Atlanta
University of Georgia Medical Department[4].....Augusta

ILLINOIS

Loyola University School of Medicine[5].....Chicago
Northwestern University Medical School.....Chicago
Rush Medical College (University of Chicago).....Chicago
University of Illinois College of Medicine.....Chicago

INDIANA

Indiana Univ. School of Med.....Bloomington-Indianapolis

IOWA

State University of Iowa College of Medicine....Iowa City

KANSAS

University of Kansas School of Med.....Lawrence-Rosedale

KENTUCKY

University of Louisville Medical Department[6]....Louisville

LOUISIANA

Tulane Univ. of Louisiana School of Med.....New Orleans

MARYLAND

Johns Hopkins University Medical Department....Baltimore
University of Maryland School of Medicine and
the College of Physicians and Surgeons.....Baltimore

MASSACHUSETTS

Boston University School of Medicine.....Boston
Medical School of Harvard University.....Boston
Tufts College Medical School.....Boston

MICHIGAN

Detroit College of Medicine and Surgery[7].....Detroit
University of Michigan Medical School.....Ann Arbor

MINNESOTA

University of Minnesota Medical School.....Minneapolis

MISSISSIPPI

University of Mississippi School of Medicine*.....Oxford

MISSOURI

St. Louis University School of Medicine.....St. Louis
University of Missouri School of Medicine*.....Columbia
Washington University Medical School.....St. Louis

NEBRASKA

John A. Creighton Medical College[8].....Omaha
University of Nebraska College of Medicine.....Omaha

* Gives only the first two years of the medical course.
1. Raised to Class A, June 9, 1919.
2. Rating raised to Class A June 6, 1910.
3. Rating raised to Class A Feb. 24, 1914; formerly the Atlanta Medical College.
4. Class A rating restored Feb. 24, 1913.
5. Rating raised to Class A March 1, 1920.
6. Rating raised to Class A June 6, 1910
7. Class A rating restored June 21, 1914.
8. Class A rating restored Feb. 4, 1917.

NEW HAMPSHIRE

Dartmouth Medical School*.....Hanover

NEW YORK

Albany Medical College.....Albany
Columbia Univ. Coll. of Phys. and Surgs....New York City
Cornell University Medical College.....New York City
Long Island College Hospital*.....Brooklyn
Syracuse University College of Medicine.....Syracuse
University and Bellevue Hospital Med. Coll..New York City
University of Buffalo Department of Medicine.....Buffalo

NORTH CAROLINA

University of North Carolina School of Med.*...Chapel Hill
Wake Forest College School of Medicine*....Wake Forest

NORTH DAKOTA

University of North Dakota School of Medicine*..University

OHIO

Ohio State University College of Medicine.....Columbus
University of Cincinnati College of Medicine.....Cincinnati
Western Reserve University School of Medicine....Cleveland

OKLAHOMA

Univ. of Oklahoma School of Med.[10]..Norman-Oklahoma City

OREGON

University of Oregon Medical School.....Portland

PENNSYLVANIA

Hahnemann Medical College and Hospital.....Philadelphia
Jefferson Medical College of Philadelphia.....Philadelphia
University of Pennsylvania School of Med.....Philadelphia
University of Pittsburgh School of Medicine[11]....Pittsburgh
Woman's Medical College of Pennsylvania.....Philadelphia

SOUTH CAROLINA

Medical College of the State of South Carolina[12]..Charleston

SOUTH DAKOTA

University of South Dakota College of Medicine*..Vermilion

TENNESSEE

University of Tennessee College of Medicine[13].....Memphis
Vanderbilt University Medical Department.....Nashville

TEXAS

Baylor University College of Medicine[14].....Dallas
University of Texas Department of Medicine.....Galveston

UTAH

University of Utah School of Medicine*.....Salt Lake City

VERMONT

University of Vermont College of Medicine.....Burlington

VIRGINIA

Medical College of Virginia.....Richmond
University of Virginia Department of Med...Charlottesville

WEST VIRGINIA

West Virginia Univ. School of Medicine*[15].....Morgantown

WISCONSIN

Marquette University School of Medicine[16].....Milwaukee
University of Wisconsin Medical School*.....Madison

Total, 68.

CLASS B—COLLEGES NEEDING GENERAL IMPROVEMENTS TO BE MADE ACCEPTABLE

CALIFORNIA

College of Medical Evangelists[17]...Loma Linda-Los Angeles

ILLINOIS

Hahnemann Medical College[18].....Chicago

NEW YORK

New York Homeopathic Medical College and Flower Hospital[19].....New York City

OHIO

Eclectic Medical College[20].....Cincinnati

PENNSYLVANIA

Temple University Department of Medicine[21]....Philadelphia

TENNESSEE

Meharry Medical College[22].....Nashville

Total, 6.

CLASS C—COLLEGES REQUIRING A COMPLETE REORGANIZATION TO MAKE THEM ACCEPTABLE

ILLINOIS

Chicago Medical School[23].....Chicago

MASSACHUSETTS

College of Physicians and Surgeons[24].....Boston
Middlesex College of Medicine and Surgery[24]....Cambridge

MISSOURI

Kansas City University of Phys. and Surgs.[25]....Kansas City
St. Louis College of Physicians and Surgeons[26]....St. Louis

TENNESSEE

University of West Tenn. Coll. of Med. and Surg..Memphis

UNCLASSIFIED

Kansas City College of Medicine and Surgery...Kansas City

This college is an offshoot of another Class C institution, the Eclectic Medical University, which has since ceased to exist. The new college has refused to have inspections made, but an abundance of information on file indicates that no rating higher than Class C could be given it. It is reported as not recognized by the licensing boards of forty states, including its home state—Missouri.

Entrance Requirements of Medical Colleges

Seventy-five medical schools are now requiring, as a minimum for entrance, *two years* or more of work in a college of liberal arts in addition to a four-year high-school education, and voluntarily submit reports to the Council by which the enforcement of their published requirements may be verified. The years when each college puts into effect, respectively, the one-year and the two-year requirements, and the rating of each college, are as follows:

College	One Year	Two Years	Rating
ALABAMA			
University of Alabama School of Medicine.....	1914	1915	A

* Gives only the first two years of the medical course.
9. Class A rating restored June 21, 1914.
10. Rating raised to Class A March 1, 1920.
11. Rating raised to Class A June 6, 1910.
12. Class A rating restored Feb. 6, 1916.
13. Rating raised to Class A June 21, 1914.
14. Rating raised to Class A June 12, 1916.
15. Class A rating restored Feb. 4, 1917.
16. Rating raised to Class A Feb. 15, 1915.
17. Rating raised to Class B Feb. 3, 1918.
18. Rating dropped to Class B June 3, 1912.
19. Rating dropped to Class B Feb. 15, 1915.
20. Rating raised to Class B June 6, 1910.
21. Rating dropped to Class B Feb. 24, 1914.
22. Formerly the Chicago Hospital College of Medicine. Last inspected April 23, 1918.
23. Rated in Class C since 1907. Last inspected Jan. 7, 1918.
24. This is the medical department of the so-called "University of Massachusetts." It was rated in Class C, Feb. 4, 1918. For several years it occupied the same building as the Massachusetts College of Osteopathy and, on inspection, the two were found to be almost indistinguishable. It has granted liberal advanced standing for courses taken in osteopathic institutions. It secured the old uncanceled charter of the Worcester Medical College of Boston, otherwise, it could hardly have obtained a charter under the strict laws now regulating the chartering of educational institutions in Massachusetts. Its predecessor was an eclectic, botanico-medical affair chartered in 1848 which had a rather precarious existence. It underwent a reorganization in 1852; moved to Boston in 1857; returned to Worcester in 1858, and became extinct in 1859. The new medical school has affiliated itself with schools of dentistry, pharmacy, chiropody, optometry, etc., under the high sounding title of the "University of Massachusetts." According to report, the latter has not secured authority from the state to grant degrees in arts or sciences and its name is not found on the list of colleges or universities approved by any recognized standardizing agency. The medical school is reported as not recognized by the medical licensing boards of forty-six states.
25. Formerly the Central College of Osteopathy; in 1917 under an amended charter took the name of Central College Medical Department; assumed present title in 1918. Rated in Class C March 15, 1918.
26. Rating dropped to Class C July 1, 1909. In 1915 it merged with the Medical Department of the National University of Arts and Sciences, but in 1917 it was reestablished. In 1918 it was reported not recognized by the Missouri State Board of Health.

ARKANSAS			
University of Arkansas Medical Department	1915	1918	A
CALIFORNIA			
College of Medical Evangelists	1914	1915	B
Stanford School of Medicine	....	1909	A
University of California Medical School	....	1905	A
COLORADO			
University of Colorado School of Medicine	....	1910	A
CONNECTICUT			
Yale University School of Medicine	....	1909	A
DISTRICT OF COLUMBIA			
Georgetown University School of Medicine	....	1912	A
George Washington University Medical School	1914	1918	A
Howard University School of Medicine	1910	1914	A
GEORGIA			
Emory University School of Medicine, Atlanta	1914	1918	A
University of Georgia Medical Department	1914	1918	A
ILLINOIS			
Loyola University School of Medicine	1915	1918	A
Hahnemann Medical College	1914	1916	B
Northwestern University Medical School	1908	1911	A
Rush Medical College (University of Chicago)	....	1904	A
University of Illinois College of Medicine	1913	1914	A
INDIANA			
Indiana University School of Medicine	1909	1910	A
IOWA			
State University of Iowa College of Medicine	1909	1910	A
KANSAS			
University of Kansas School of Medicine	....	1909	A
KENTUCKY			
University of Louisville Medical Department	1914	1918	A
LOUISIANA			
Tulane University of Louisiana School of Medicine	1910	1918	A
MARYLAND			
Johns Hopkins University Medical Department	....	1893	A
University of Maryland School of Medicine and College of Physicians and Surgeons	1914	1918	A
MASSACHUSETTS			
Boston University School of Medicine	1914	1916	A
Medical School of Harvard University	....	1900	A
Tufts College Medical School	1914	1918	A
MICHIGAN			
Detroit College of Medicine and Surgery	1914	1918	A
University of Michigan Medical School	....	1909	A
MINNESOTA			
University of Minnesota Medical School	....	1907	A
MISSISSIPPI			
University of Mississippi School of Medicine	1914	1918	A
MISSOURI			
St. Louis University School of Medicine	1910	1918	A
University of Missouri School of Medicine	1906	1910	A
Washington University Medical School	1910	1912	A
NEBRASKA			
John A. Creighton Medical College	1914	1918	A
University of Nebraska College of Medicine	1908	1909	A
NEW HAMPSHIRE			
Dartmouth Medical School	....	1910	A
NEW YORK			
Albany Medical College	1914	1918	A
Columbia University College of Phys. and Surg.	....	1910	A
Cornell University Medical College	....	1908	A
Long Island College Hospital	1914	1918	A
New York Homeo. Med. Coll. and Flower Hospital	1915	1919	B
Syracuse University College of Medicine	1909	1910	A
University and Bellevue Hospital Medical College	1912	1918	A
University of Buffalo Department of Medicine	1914	1918	A
NORTH CAROLINA			
Wake Forest College School of Medicine	....	1908	A
University of North Carolina School of Medicine	1910	1917	A
NORTH DAKOTA			
University of North Dakota School of Medicine	....	1907	A
OHIO			
Eclectic Medical College	1915	1918	B
Ohio State University College of Medicine	1914	1915	A
University of Cincinnati College of Medicine	1910	1913	A
Western Reserve University School of Medicine	....	1901	A
OKLAHOMA			
University of Oklahoma School of Medicine	1914	1917	A
OREGON			
University of Oregon Department of Medicine	1910	1915	A
PENNSYLVANIA			
Hahnemann Medical College and Hospital	1914	1917	A
Jefferson Medical College	1914	1917	A
Temple University Medical Department	1914	1918	B
University of Pennsylvania School of Medicine	1909	1910	A
University of Pittsburgh School of Medicine	1911	1913	A
Woman's Medical College of Pennsylvania	1914	1915	A
SOUTH CAROLINA			
Medical College of the State of South Carolina	1914	1916	A
SOUTH DAKOTA			
University of South Dakota College of Medicine	1908	1909	A
TENNESSEE			
Meharry Medical College	1914	1918	B
Vanderbilt University Medical Department	1914	1918	A
University of Tennessee College of Medicine	1914	1918	A
TEXAS			
Baylor University College of Medicine	1913	1918	A
University of Texas Department of Medicine	1910	1917	A
UTAH			
University of Utah School of Medicine	1909	1910	A
VERMONT			
University of Vermont College of Medicine	1912	1918	A
VIRGINIA			
Medical College of Virginia	1914	1915	A
University of Virginia Department of Medicine	1910	1917	A
WEST VIRGINIA			
West Virginia University School of Medicine	1911	1917	A
WISCONSIN			
Marquette University School of Medicine	1913	1915	A
University of Wisconsin Medical School	....	1907	A

Total, 74.

The seven following medical colleges either have not announced the higher entrance requirements or evidence has not been received to show that they have been enforced for all students enrolled:

	Rating
Chicago Medical School	C
College of Physicians and Surgeons, Boston	C
Middlesex College of Medicine and Surgery, Cambridge, Mass.	C
Kansas City College of Medicine and Surgery	*
Kansas City University of Physicians and Surgeons	C†
St. Louis College of Physicians and Surgeons	C
University of West Tenn. Coll. of Med. and Surg., Memphis	C

* This college is an offshoot of the Eclectic Medical University; it has refused to have an inspection made. It is reported not recognized by the Missouri State Board of Health and by licensing boards of 40 other states.

† This college was formerly the Central College of Osteopathy; in 1916 it assumed the title Central College Medical Department, and took its present name in 1918.

FOREIGN MEDICAL COLLEGES

(Revised to Aug. 15, 1922)

This list has been prepared from data collected by the Council on Medical Education and Hospitals:

ARGENTINE REPUBLIC

Buenos Aires.—Universidad Nacional de Buenos Aires.
Cordova.—Universidad Nacional de Cordoba.
La Plata.—Universidad Nacional de La Plata.
Rosario.—Universidad del Litoral.

AUSTRALIA

Adelaide.—University of Adelaide.
Melbourne.—University of Melbourne.
Sydney.—University of Sydney.

AUSTRIA

Graz, Styria.—K. K. Karl Franzens Universität.
Innsbruck, Tyrol.—K. K. Leopold Franzens Universität.
Vienna, Nether Austria.—K. K. Universität.

BELGIUM

Brussels.—Université Libre de Bruxelles.
Ghent.—Université de l'Etat de Gand.
Liége.—Université de Liége.
Louvain.—Université Catholique.

BOLIVIA

La Paz.—Universidad de La Paz.
Sucre.—Universidad de Sucre.

BRAZIL

Bahia.—Faculdade de Medicina, Cirurgia e Pharmacia.
Bello Horizonte, Minas.—Faculdade de Medicina e Cirurgia.
Manaos, Amazonas.—Universidade de Manaos.
Porto Alegre.—Escola de Medicina e Odontologia de Porto Alegre.
Porto Alegre.—Faculdade Livre de Medicina e Pharmacia.
Rio de Janeiro.—Faculdade de Medicina, Cirurgia e Pharmacia.
São Paulo.—Faculdade de Medicina e Cirurgia.

CANADA

Edmonton, Alberta.—University of Alberta, Faculty of Medicine.
Halifax, Nova Scotia.—Dalhousie University.
Kingston, Ontario.—Queen's University.
London, Ontario.—Western University.
Montreal, Quebec.—McGill University.

Montreal, Quebec.—Montreal School of Medicine.
Quebec, Quebec.—Université Laval.
Toronto, Ontario.—University of Toronto.
Winnipeg, Manitoba.—University of Manitoba (Manitoba Medical College).

CHILE

Santiago.—Universidad de Chile.

CHINA

City Province College
Canton, Kwangtung.—Chung-fa Medical College.
Canton, Kwangtung.—Hackett Medical College (Women).
Canton, Kwangtung.—Kung Yee Medical College.
Canton, Kwangtung.—Kwangtung Provincial Medical College.
Canton, Kwangtung.—Kwang Wa Medical College.
Canton, Kwangtung.—Liang Yueh Medical College.
Changsha, Hunan.—Hunan-Yale College of Medicine.*
Chengtu, Szechuan.—West China Christian University School of Medicine.
Foochow, Fukien.—Union Medical College.
Hangchow, Chekiang.—Chekiang Provincial Medical College.
Hangchow, Chekiang.—Hangchow Medical Training College.
Hankow, Hupeh.—Union Medical College.
Hongkong, Hongkong.—Hongkong University School of Medicine.
Moukden, Manchuria.—Moukden Medical College.*
Peking, Chihli.—Board of Education Medical College.
Peking, Chihli.—Union Medical College.*
Peking, Chihli.—Union Medical College for Women.
Shanghai, Kiangsu.—German School of Medicine.
Shanghai, Kiangsu.—Pennsylvania St. John's Medical School.*
Soochow, Kiangsu.—Elizabeth Blake Medical Training College.
Soochow, Kiangsu.—Kiangsu Provisional Medical College.
Soochow, Kiangsu.—Woman's Medical College.
Tientsin, Chihli.—Army Medical College.
Tientsin, Chihli.—Navy Medical College.
Tsinanfu, Shantung.—Shantung Christian University School of Medicine.*

The five colleges indicated by an asterisk (*) are eligible to membership in the Association of Medical Colleges of China. Membership in that association is limited to such colleges as provide a four-year medical course, preceded by adequate college courses, with laboratory work, in physics, chemistry and biology, based on high school graduation.

COLOMBIA

Bogota.—Universidad de Bogota.
Cartagena.—Universidad de Cartagena.

COSTA RICA

San Jose.—Escuela de Medicina y Farmacia.

CUBA

Habana.—Universidad de la Habana.

CZECHOSLOVAKIA

Prague.—K. K. Deutsche Karl Ferdinands Universität.
Prague.—C. K. Ceská Universita Karlo-Ferdinandova.

DENMARK

Copenhagen.—Kjobenhavns Universitet.

ECUADOR

Cuenca.—Universidad del Azuay.
Guayaquil.—Universidad del Guayas.
Quito.—Universidad Central de Ecuador.

EGYPT

Cairo.—Kasr il Aini (School of Medicine).

ENGLAND

Birmingham.—University of Birmingham.
Bristol.—University of Bristol.
Cambridge.—University of Cambridge.
Durham.—Durham University (Durham College of Medicine).
Leeds.—University of Leeds.
Liverpool.—University of Liverpool.
London.—University of London (including the following Medical Schools: (*a*) St. Bartholomew's Hospital, (*b*) Charing Cross Hospital, (*c*) St. George's Hospital, (*d*) Guy's Hospital, (*e*) King's College, (*f*) London Hospital, (*g*) St. Mary's Hospital, (*h*) Middlesex Hospital, (*i*) St. Thomas Hospital (*j*) University College, (*k*) Westminster Hospital, and (*l*) Royal Free Hospital (School of Medicine for Women).
Manchester.—Victoria University (Owen's College, founded in 1851, was merged into Victoria University in 1905).
Oxford.—University of Oxford.
Sheffield.—University of Sheffield.

FINLAND

Helsingfors.—University of Helsingfors.

FRANCE

Faculties of Medicine (to degree of doctor of medicine, including the five required examinations.)
Bordeaux.—Université de Bordeaux.
Lille.—Université de Lille.
Lyons.—Université de Lyons.
Montpellier.—Université de Montpellier.
Nancy.—Université de Nancy.
Paris.—Université de Paris.
Strasbourg.—Université de Strasbourg.
Toulouse.—Université de Toulouse.
Preparatory Schools of Medicine.—Graduates of the 16 following schools are allowed to take the first two examinations if they are presided over by some member of a medical faculty:
(*a*) *"Full Exercise,"* or complete course (covering the work of 16 trimesters).
Algiers (Africa).—Académie d'Algier.
Marseilles.—Université d'Aix Marseille.
Nantes.—Ecole de Plein Exercice de Médecine et de Pharmacie (part of the University of Rennes).
Rennes.—Université de Rennes.
(*b*) *Reorganized Schools.*—(Completing the first 12 trimesters).
Amiens.—Ecole Préparatoire de Médecine et de Pharmacie (part of the University of Lille).
Angers.—Ecole Préparatoire de Médecine et de Pharmacie (part of the University of Rennes).
Besancon.—Université de Besancon.
Caen.—Université de Caen.
Clermont.—Université de Clermont.
Dijon.—Université de Dijon.
Grenoble.—Université de Grenoble.
Limoges.—Ecole de Médecine et de Pharmacie (part of the University of Poitiers).
Poitiers.—Université de Poitiers.
Reims.—Ecole Préparatoire de Médecine et de Pharmacie (part of the University of Paris).
Rouen.—Ecole de Médecine et de Pharmacie (part of the University of Caen).
Tours.—Ecole Préparatoire de Médecine et de Pharmacie (part of the University of Poitiers).

GERMANY

Berlin, Prussia.—Königliche Friedrich-Wilhelm Universität.
Bonn, Prussia.—Rheinische Friedrich-Wilhelms-Universität.
Breslau, Prussia.—Königliche Universität.
Erlangen, Bavaria.—Königliche Friedrich-Alexanders Universität.
Frankfort-on-the-Main.—Universität.
Freiberg, Baden.—Grossherzogliche Badische Albert-Ludwigs-Universität.
Giessen, Hesse.—Grossherzogliche Hessische Ludwigs-Universität.
Göttingen, Prussia.—Königliche Georg-August-Universität.
Greifswald, Prussia.—Königliche Universität.
Halle, Prussia.—Vereinigte Friedrichs-Universität, Halle-Wittenberg.
Heidelberg, Baden.—Grossherzogliche Ruprecht-Karls-Universität.
Jena, Thuringia.—Grossherzogliche und Herzogliche Sächsiche Gesamt, Universität.
Kiel, Prussia.—Königliche Christian-Albrechts-Universität.
Königsberg, Prussia.—Königliche Albertus-Universität.
Leipzig, Saxony.—Universität.
Marburg, Prussia.—Universität.
Munich, Bavaria.—Königliche Bayr. Ludwig-Maximilians-Universität.
Rostock, Mecklenburg.—Universität.
Tübingen, Wurttemberg.—Königliche Eberhard-Karls-Universität.
Würzburg, Bavaria.—Königliche Julius-Maximilians Universität.

GREECE

Athens.—National University.

GUATEMALA

Guatemala.—Facultad de Medicina y Cirugia.

HAITI

Port au Prince.—L'Ecole Nationale de Médecine.

HONDURAS

Tegucigalpa.—Facultad de Medicina.

HUNGARY

Budapest.—Budapesti Királyi Magyar Tudomány-Egyetem (Royal Hungarian University).
Pressburg.—Royal Hungarian University.

ICELAND

Reykjavik.—Loeknaskoli (School of Physicians).

INDIA

Allahabad.—University of Allahabad.
Bombay.—University of Bombay (Grant Medical College).
Calcutta.—University of Calcutta (Medical College of Bengal).
Lahore.—Punjab University (Lahore Medical College).
Madras.—University of Madras (Madras Medical College).
Ceylon (Columbo).—The Ceylon Medical College.

NOTE.—The colleges named above are accredited by the Examining Board in England. There is another medical college at Calcutta (Belgachia Medical College), a private enterprise managed by Bengali medical men. There is also, at Lucknow, the King George's Medical College. These are not reported as recognized by the Examining Board in England. Minor medical colleges, which are also not accredited, are located at Agra, Ahmedabad, Dacca, Dibragarh, Hyderabad, Lahore, Poona, Rangoon, Rayapuram, Tanjore and Vizagapatam. In 1916 the first college for women in India, known as the Hardinge Women's Medical College, was opened at Delhi.

IRELAND

Belfast.—Queen's University.
Dublin.—National University of Ireland (including University College, Dublin; University College, Cork; University College, Galway).
Dublin.—University of Dublin (The School of Physic in Ireland, Trinity College).
Dublin.—Royal College of Surgeons in Ireland Schools of Surgery.

ITALY

Bologna.—Regia Università degli Studi.
Cagliari, Sardinia.—Università degli Studi.
Camerino.—Libera Università degli Studi. Gives only the first four years of the six-year medical course and does not grant degrees.
Catania.—Regia Università degli Studi di Catania.
Ferrara.—Libera Università degli Studi di Ferrara.
Florence.—Regia Instituto di Studi Superiori, Practici e di Perfezionamento.
Genoa.—Regia Università degli Studi.
Messina.—Regia Università degli Studi.
Milan.—Regia Università degli Studi.
Modena.—Regia Università degli Studi.
Naples.—Regia Università degli Studi.
Padua.—Regia Università degli Studi.
Palermo.—Regia Università degli Studi.
Parma.—Regia Università degli Studi.
Pavia.—Regia Università degli Studi.
Perugia.—Università Libra degli Studi.
Pisa.—Regia Università degli Studi.
Rome.—Regia Università degli Studi.
Sassari.—Regia Università degli Studi.
Siena.—Regia Università degli Studi.
Turin.—Regia Università degli Studi.

JAPAN

Chiba.—Chiba Special Medical School.
Fukuoka.—Kyushu Imperial University Medical College. (Formerly a part of Kyoto Imperial University.)
Kanazawa.—Kanazawa Special Medical School.
Kumamoto.—Kumamoto Special Medical School.
Kumamoto.—Shunu Medical College (extinct in 1896).
Kyoto.—Kyoto Imperial University, Medical College.[1]
Kyoto.—Kyoto Prefecture, Special Medical School.
Moukden.—South Manchuria Medical School.
Nagasaki.—Nagasaki Special Medical School.
Nagoya.—Aichi Prefecture, Special Medical School.
Niigata.—Niigata Special Medical School.
Okayama.—Okayama Special Medical School.
Osaka.—Osaka Prefecture, Higher Medical School.[1]
Sendai.—Tohoku Imperial University Medical College.[1]
Tansui, Taiwan.—Taiwan (Formosa) Medical School.[2]
Tokyo.—Nippon Special Medical School.[3]
Tokyo.—Sai Sei Medical College (Extinct August, 1903).
Tokyo.—Tokyo Charity Hospital Special Medical School.
Tokyo.—Tokyo Imperial University, Medical College.[1]
Tokyo.—Tokyo Woman's Special Medical School.[3]

1. For admission require graduation from the "Third Department of the Higher Schools," which covers three years of premedical training following graduation from the Middle Schools.
2. A medical school conducted by the Japanese government, primarily for the aborigines of Taiwan (Formosa). Only a common school education required for admission. Graduates licensed to practice in Tansui only.
3. Graduates not licensed by the Japanese government unless they pass a special examination.

JAVA

Batavia.—Schoot Tot Opleiding van Inl. Artsen.

KOREA

Seoul.—Severance Union Medical College.

MADAGASCAR

Tananarivo.—Ecole de Médecine.

MALAYA

Singapore.—King Edward VII College of Medicine.

MALTA

Malta.—University of Malta Medical School.

MEXICO

Jalisco, Guadalajara.—Escuela de Medicina y de Farmacia de Guadalajara.
Mexico.—Escuela Nacional de Medicina.
Mexico.—Escuela Homeopatica Nacional.
Mexico.—Escuela Libre de Homeopatia.
Mexico.—Escuela Medico-Militar.
Monterey.—Escuela de Medicina.
Morelia.—Escuela de Medicina del Estado de Michoacan de Ocampo.
Oaxaca.—Escuela de Medicina.
Puebla.—Escuela de Medicina y Farmacia.
San Luis Potosi.—Instituto Literario y Cientifico (Escuela de Medicina de San Luis Potosi).
Merida, Yucatan.—Escuela de Medicina y de Farmacia de Yucatan.

NETHERLANDS

Amsterdam.—Universiteit van Amsterdam.
Groningen.—Rijks-Universiteit te Groningen.
Leyden.—Rijks-Universiteit.
Utrecht.—Rijks-Universiteit.

NEW ZEALAND

Dunedin.—University of Otago. (This is the recognized school of medicine among the four affiliated colleges which constitute the University of New Zealand. The first year in medicine may be taken at any of the other three affiliated colleges.)

NICARAGUA

Leon.—Universidad de Nicaragua.

NORWAY

Christiania.—Kongelige Frederiks Universitet.

PARAGUAY

Asuncion.—Universidad Nacional.

PERSIA

Urumia.—Urumia College Medical Department.

PERU

Lima.—Universidad Mayor de San Marcos.

POLAND

Cracow.—University of Cracow.
Lvow.—University of Lvow.
Warsaw.—University of Warsaw.

PORTUGAL

Coimbra.—Universidade de Coimbra.
Lisbon.—Escola Medico-Cirurgica.
Oporto.—Escola Medico-Cirurgica.

ROUMANIA

Bukharest.—Universitatea din Bucuresti.
Jassy.—Universitatea din Jasi.
Klausenburg.—Kolozsvári Magyar Királyi Ferencz-József Tudomány-Egyetem (Royal Hungarian Franz-Joseph University).

RUSSIA

Jurjev (formerly Dorpat).—Imperatorski Jurjevskij Universitet.
Kazan.—Imperatorskij Kasanskij Universitet.
Kharkov.—Imperatorskij Charkovskij Universitet.
Kief.—Imperatorskij Universitet Sv. Vladimira.
Moscow.—Imperatorskij Moskovskii Universitet.
Odessa.—Imperatorskij Novorossijskij Universitet.
Petrograd.—Imperial Univ. of Petrograd.
Tomsk, Siberia.—Tomskij Universitet.

It is not known whether all these medical schools are now existing.

SAN SALVADOR

San Salvador.—University of San Salvador.

SANTO DOMINGO

Santo Domingo.—University of Santo Domingo Fac. of Med. and Natural Sciences.

SCOTLAND

Aberdeen.—University of Aberdeen.
Dundee.—University of St. Andrews (University College).
Edinburgh.—University of Edinburgh.
Edinburgh.—School of Medicine of the Royal Colleges (including the Surgeons' Hall School).
Glasgow.—University of Glasgow (including Queen Margaret College).
Glasgow.—Anderson's College Medical School.
Glasgow.—St. Mungo's College and Glasgow Royal Infirmary.
Glasgow.—Western Medical School (closed 1915).

SIAM

Bangkok.—Chulalongkorana University.

SOUTH AFRICA

Cape Town.—South African Medical College.
Johannesburg.—University of the Witwatersrand.

SPAIN

Barcelona.—Universidad.
Cadiz.—Facultad de Medicina.
Granada.—Universidad.
Madrid.—Universidad Central de España.
Salamanca.—Universidad.
Santiago.—Universidad.
Saragossa.—Universidad.
Seville.—Universidad. (To this university also belongs the Medical Faculty at Cadiz.)
Valencia.—Universidad.
Valladolid.—Universidad.

SWEDEN

Lund.—Kungl. Karolinska Universitetet.
Stockholm.—Karolinska Institutet (Medico-Chirurgical Institute). (This institute has the same chancellor as the universities at Lund and Upsala, and is guided by a similar constitution.)
Upsala.—Kungl. Universitetet i Upsala.

SWITZERLAND

Basel.—Universität de Basel.
Berne.—Kantonale Universität.
Fribourg.—Universität de Fribourg.
Geneva.—Université de Genève.
Lausanne.—Université de Lausanne.
Neuchâtel.—Université de Neuchâtel.
Zurich.—Universität.

SYRIA

Beirut.—American University Medical School.
Beirut.—Université Saint Joseph de Beyrouth.

TURKEY

Constantinople.—University of Constantinople. (Another medical department of this university is located at Damascus.)

URUGUAY

Montevideo.—Universidad.

VENEZUELA

Caracas.—Escuela de Medicina de Caracas.
Merida.—Universidad de Merida.
Note.—Medicine is taught at the two active institutions but the M.D. degree is conferred by the Secretary of Public Instruction.

WALES

Cardiff.—University of Wales (Cardiff School of Medicine). (Gives only the first three years of the medical course.)

MEDICAL COLLEGES OF THE WORLD

Nation	Colleges	Nation	Colleges
Argentina	4	Korea	1
Austria	3	Madagascar	1
Belgium	4	Malaya	1
Bolivia	2	Malta	1
Brazil	7	Mexico	11
Canada	9	Netherlands	4
Chile	1	New Zealand	1
China	25	Nicaragua	1
Colombia	2	Norway	1
Costa Rica	1	Paraguay	1
Cuba	1	Persia	1
Czechoslovakia	2	Peru	1
Denmark	1	Poland	3
Ecuador	3	Portugal	3
Egypt	1	Roumania	3
England	21	Russia	7
Finland	1	San Salvador	1
France	8	Santo Domingo	1
Germany	20	Scotland	8
Greece	1	Siam	1
Guatemala	1	South Africa	2
Haiti	1	Spain	10
Honduras	1	Sweden	3
Hungary	2	Switzerland	7
Iceland	1	Syria	2
India	20	Turkey	1
Ireland	4	Uruguay	1
Italy	21	United States	81
Japan	20	Venezuela	2
Java	1	Wales	1

Total medical colleges in all countries.....351

There are also about 20 sectarian schools in the United States, the graduates of which treat diseases, giving this country a total of.....101

GRADUATE COURSES IN PUBLIC HEALTH

Graduate courses in public health have been established in connection with eleven medical schools, the first of which was at the University of Pennsylvania in 1909; the latest is that in connection with the medical department of Howard University, which began its course in 1922. Yale University established its course in public health in 1917. Two institutions, the University of Colorado and Tulane University, suspended their course in 1918. Seven of the schools have courses leading to the degree of Doctor of Public Health (Dr.P.H.) after a two year course and one (the Detroit College of Medicine and Surgery) offers it after a one year course. The University of California offers instead the degree of Graduate in Public Health (Gr.P.H.) after a two year course. After a one year course the degree of Certified Sanitarian (C.S.) is offered by the University of Pennsylvania and Howard University to graduates of colleges of arts and sciences. Six of the schools grant a certificate in public health (C.P.H.) after a one year course. The degree of Master of Public Health (M.P.H.) is offered after a one year course by the University of Wisconsin Medical School. The Master in Arts in Public Health [M.A. (P.H.)] is offered by the University of California Medical School, and the Master in Science in Public Health [M.S. (P.H.)] by the University of Michigan and by Howard University. The courses offered by the eleven schools of public health are as follows:

THE UNIVERSITY OF CALIFORNIA: Courses began in 1915; number of instructors, 20; three courses leading to degree of Gr.P.H.: (a) a four year course covering two years in the college of letters and science and two years in the graduate division; (b) a two year course in the graduate division for graduates of the College of Civil Engineering who have completed the work in sanitary engineering, and (c) a course of one and a half years in the grade division for students who have completed three and a half years of the medical course. Completion of this third course gives the degrees of M.D. and Gr.P.H. The University of California also offers a one year course to persons holding a bachelor's degree based on a major in public health for the degree of Master in Arts in Public Health [M.A. (P.H.)]. A thesis is required for the degree. The course extends from August to May.

YALE UNIVERSITY GRADUATE COURSE IN PUBLIC HEALTH: The graduate course in public health at Yale University School of Medicine was first established in 1917, and during 1921-1922 there were seventeen instructors. A one year course leads to the certificate in public health (C.P.H.), a three year course leads to the degree of Doctor of Philosophy (Ph.D.), and to medical graduates only, a two year course leads to the degree of Doctor of Public Health (Dr.P.H.). Theses are required in all cases. The fees are $200 per year. The course extends from October to June. During 1921-1922, 21 students were enrolled, and in June, 1922, 5 certificates and 4 degrees were granted.

JOHNS HOPKINS UNIVERSITY SCHOOL OF HYGIENE AND PUBLIC HEALTH was opened in October, 1918. There are 12 professors and 37 lecturers, associates and instructors, a total of 49. Four courses are offered: (a) A two year course leading to the degree of Dr.P.H., requiring for admission a bachelor's degree and a degree in medicine. The degree of M.D. and the degree of Dr.P.H. may be obtained in a combined course of five years. A thesis is required for graduation. (b) A three year course leading to the degree of Doctor of Science in Hygiene requiring for admission a bachelor's degree and adequate training in physics, chemistry, biology and the medical sciences, anatomy, physiology and pathology. A written and oral examination and a dissertation embodying the results of an independent investigation are required for graduation. (c) A two year course leading to the degree of Bachelor of Science in Hygiene, the course consisting of combined work in the medical school and the School of Hygiene and Public Health. For admission the applicant must have completed at least two years of work in an approved college and have studied courses in physics, biology, inorganic and organic chemistry. (d) A one year course leading to a certificate in public health is also offered to graduates of approved medical schools or graduates in arts or sciences who present evidence of satisfactory training in the physical and medical sciences. An intensive course of six weeks for public health officers is offered at the beginning of the second trimester. The fees charged are $250 per year. Courses for special students are $50 per trimester. Altogether 141 students were enrolled during 1921-1922, including 14 who were candidates for degrees and 6 for the certificate in public health. The course extends from October 3 to June 13.

HOWARD UNIVERSITY SCHOOL OF PUBLIC HEALTH AND HYGIENE will open at the beginning of the fall term, 1922. Five courses offered: (a) one year course to graduates in medicine leading to degrees of Certified Sanitarian (C.S.) or Bachelor of Science (B.S.) in Public Health. (b) Two years course to graduates in medicine leading to degree of Doctor of Public Health (Dr.P.H.). (c) Fifth year in medicine to Howard University medical students immediately following their graduation leading to the degree of Doctor of Public Health (Dr.P.H.). For graduates of recognized colleges and universities a one year course leading to the certificate in public health (C.P.H.) and a two year course leading to the degree of Master of Science (M.S.) is offered. For information write to Dr. Algernon B. Jackson, Director.

MEDICAL SCHOOL OF HARVARD UNIVERSITY: The School of Public Health was opened in 1910; there are 42 instructors. A one year course is offered leading to a certificate in public health. For admission the applicant must have completed two years of work in a recognized medical school, or have received a bachelor's degree from an approved college or technical school, or have had special experience in public health work. In any instance he must show evidence of having completed satisfactory courses in physics, chemistry and biology and modern languages and the fundamental medical sciences. Although not a prerequisite, all candidates are advised to obtain a medical degree before specializing in public health work. Fees are $250 per year. Students enrolled in 1921-1922, 35; certificates in public health awarded, 13. Course extends from October to June.

DETROIT COLLEGE OF MEDICINE AND SURGERY: The course began in 1913 with ten instructors. A one year course leading to the degree of Doctor of Public Health (Dr.P.H.) is offered to graduates of approved medical schools. The work is conducted at the college, the Detroit City Board of Health, and the Municipal Contagious Hospital. It includes sanitary engineering, laboratory, clinical and field work. Fees are $200 per year. No thesis required. No students enrolled during the past session. Mr. J. Werness, Registrar. The course extends from September to June.

THE UNIVERSITY OF MICHIGAN GRADUATE SCHOOL: The graduate courses in public health were established in the University of Michigan in 1913. The number of instructors is approximately 12. Two courses are offered—one to graduates in arts and sciences or medicine extending from one to two years, leading to the degree of Master of Science in Public Health; the other a course of from two to three years in length for graduates in arts or sciences and medicine, leading to the degree of Doctor of Public Health (Dr.P.H.). For residents of Michigan the fees consist of $10 matriculation and $82 for men students and $77 for women; for nonresidents of Michigan, matriculation $25 and an annual fee of $107 for men and $102 for women. A thesis is required for the degree of Dr.P.H. There is a summer session, but the regular session extends from September 26 to June 18. In 1921-1922, 5 students were enrolled. Dr. Alfred H. Lloyd, Dean.

ALBANY MEDICAL COLLEGE: Postgraduate courses in infectious diseases and public health were begun in 1919. Of the class of 1922, 23 physicians received the certificates, having completed the course. The total number of certificates issued since 1919 for the course is 128. Dr. Charles C. Duryee, Director of Course.

UNIVERSITY AND BELLEVUE HOSPITAL MEDICAL COLLEGE: The graduate course in public health began in 1916. Two courses are offered—a two year course leading to the degree of Doctor of Public Health for graduates of approved medical schools, and a course leading to a certificate of attendance. This may be taken in 26 days of residence or as a correspondence course requiring a study of about 3,000 pages on public health subjects, especially adapted for health officers. The tuition for Dr.P.H. course is $200 for the first year and $25 for the second. The fee for either the correspondence or the 26 days residence course is $30, including the matriculation fee. For the correspondence course the last week must be spent in residence. The courses begin in October. There were 30 health officers who took the correspondence course last year and 11 who took the residence course. Two are taking the Dr.P.H. course.

THE UNIVERSITY OF PENNSYLVANIA: The graduate courses in public hygiene began in 1906; there are 19 instructors; two courses are offered, —a two year course for graduates in medicine leading to the degree of Dr.P.H., and a one year course for graduates of arts or science leading to the degree of Certified Sanitarian. A thesis is required for graduation. The fees are $250 per year. There were 4 students during 1921-1922; 3 graduates. The course extends from October to June.

THE UNIVERSITY OF WISCONSIN: Graduate courses in public health began in 1910. There are eight teachers. Two courses are offered—a one year course for graduates in medicine, leading to the degree of Master of Public Health (M.P.H.); the other a two year course for physicians, leading to the degree of Doctor of Public Health. Fees are $50 per year for residents of Wisconsin and $170 for nonresidents. A thesis is required for graduation. Address inquiries to Miss Grace E. Brewster, Secretary, Medical School.

GRADUATE COURSES IN MEDICAL SCHOOLS

Special correspondence with medical schools shows that there are many opportunities for graduate study which physicians have not been able to take advantage of through the lack of knowledge in regard to them. The following list has been prepared to correct this deficiency. More complete information can be obtained by correspondence with the medical school concerned.

CALIFORNIA

STANFORD UNIVERSITY SCHOOL OF MEDICINE, San Francisco.—Graduate courses are open to physicians: (a) Mid-day clinics, 11:30 to 12:30 daily, covering medicine, medical specialties, surgical specialties, obstetrics, gynecology and pathologic conferences free of charge. (b) Clinical demonstrations at the San Francisco Hospital. On Thursdays beginning at 9 a. m., the work is in surgery and the surgical specialties; on Fridays, beginning 9 a. m., medicine and the medical specialties. These courses are free of charge. (c) Assistantships in clinics and laboratories. A physician may be assigned to some research problem or receive regular instruction from a member of the staff. For the latter an appropriate fee is charged and a nominal fee also for material used. During the last five years an average of 28 physicians each year has occupied these assistantships.

UNIVERSITY OF CALIFORNIA MEDICAL SCHOOL.—Resident positions are open to properly qualified medical graduates as follows: In the Univer-

sity Hospital: A resident position in general medicine and four assistant residentships, one each in general medicine and dermatology; in neuro-psychiatry and infirmary; in outpatient department; in medical research. Besides a residentship in surgery, there are five assistant residentships, one each in general surgery, urology, orthopedic surgery, ophthalmology, otorhinolaryngology, outpatient department and surgical pathology. There are a residentship and two assistant residentships each in pediatrics and in obstetrics and gynecology. There is one residentship each in pathology and in biochemistry and clinical laboratories. In the San Francisco Hospital there are two positions as house officers in medicine and tuberculosis; two in surgery; one in pediatrics and isolation and one in obstetrics and gynecology. Special courses to physicians and advanced students are open in the departments of anatomy (at Berkeley) neuro-surgery, pathology, and research medicine.

COLORADO

UNIVERSITY OF COLORADO SCHOOL OF MEDICINE, Boulder-Denver.—During the present summer, courses for physicians were given in bacteriology, biochemistry, blood chemistry, anatomy, histology, embryology, clinical laboratory technic, advanced pathology and ophthalmology. The session extended from June 12 to August 27, divided into two terms. Physicians may register for either term or for the entire quarter.

ILLINOIS

RUSH MEDICAL COLLEGE, Chicago.—The following courses are offered for physicians: (a) A course on tuberculosis. (b) Special course for three or four physicians who are willing to spend a full year in diseases of the ear, nose and throat. (c) Attendance at arena clinics for which a visitor's ticket for a week is issued—registration not limited. (d) Opportunities for a few physicians for investigative work in the sciences fundamental to medicine, including pathology. Fees: $25 for each major's work, or $75 for a full quarter.

UNIVERSITY OF ILLINOIS COLLEGE OF MEDICINE, Chicago.—The summer quarter is devoted to graduate work and courses for physicians, and during the remainder of the year a large number of fellowships are available in courses leading to the degrees of Master of Science and Doctor of Philosophy. Special opportunities for individual research work in anatomy, biochemistry, pharmacology, and pathology and bacteriology were offered during the present summer quarter.

INDIANA

INDIANA UNIVERSITY SCHOOL OF MEDICINE, Indianapolis.—At any time during the year special arrangements will be made for the physicians of Indiana who make application to receive instruction with the medical students or alone. During the summer a well arranged six weeks' course is offered to the physicians of Indiana in medicine, surgery, pathology (including immunology and bacteriology) and biochemistry.

IOWA

STATE UNIVERSITY OF IOWA COLLEGE OF MEDICINE, Iowa City.—During the present summer a four weeks' general clinical course limited to 12 physicians was offered. There are opportunities for physicians to act as clinical assistants, research workers, hospital chemists, etc., in the various departments of the medical school. Special opportunities are always open for physicians with research ability.

MARYLAND

JOHNS HOPKINS UNIVERSITY MEDICAL DEPARTMENT, Baltimore.—During the present summer a six weeks' course in medical diagnosis was offered, limited to twenty physicians. The course consisted in ward rounds, lectures, clinics, group courses, physical diagnosis, laboratory work in clinical microscopy, and group clinics in the special study of syphilis. Opportunities for advanced work open to a certain number of qualified men. The work is arranged for after personal communication between the applicants and the heads of the various departments.

UNIVERSITY OF MARYLAND SCHOOL OF MEDICINE, Baltimore.—Courses are open for physicians in anatomy, pathology, bacteriology, clinical laboratory, operative surgery, obstetrics, genito-urinary diseases, roentgenology and pediatrics. Arrangements made by personal communication.

MICHIGAN

UNIVERSITY OF MICHIGAN MEDICAL SCHOOL, Ann Arbor.—The regular laboratory and clinical courses in the school are open to qualified physicians. In addition special work is arranged along all clinical and laboratory branches to meet the special needs of the applicant. Such courses may lead to the degrees of Master of Science or Doctor of Philosophy.

MISSOURI

WASHINGTON UNIVERSITY SCHOOL OF MEDICINE, St. Louis.—Washington University School of Medicine has established a series of post-graduate medical courses in all the various clinical branches. These courses make use of the laboratory, clinical and library facilities of the school and its allied hospitals. The courses are planned so as to run approximately four weeks once a year and to consist of subjects so grouped as to furnish the student a comprehensive training in the works he selects. This is accomplished by combining with the major subjects numerous fundamentally related subjects of lesser, though vital, importance. In addition to these combined courses, detached courses are offered, thus affording students a wide range of selection. The plan of instruction furthermore provides for one and two year courses in some of the specialties so as to furnish opportunities to men desiring to qualify as specialists. A descriptive pamphlet is available for all applicants who request it by addressing the Dean.

NEBRASKA

UNIVERSITY OF NEBRASKA COLLEGE OF MEDICINE, Omaha.—A special two weeks' course for practitioners is offered each June. Subjects stressed are physical diagnosis; general medical and surgical diagnosis; pediatrics, including infant feeding; syphilis and skin. Ward walks in the University Hospital are conducted twice daily. Evening illustrated lectures cover topics of general medical and surgical interest. The wards of the University Hospital and the outpatient department are utilized for clinical material.

NEW YORK

LONG ISLAND COLLEGE HOSPITAL, Brooklyn.—Courses open in anatomy, embryology, neuro-anatomy, histology, bacteriology, biochemistry, physiology, preventive medicine and hygiene. Also opportunities for research work in anatomy, biochemistry and physiology. Postgraduate courses in anatomy, physiology, genito-urinary, surgery, medicine, bacteriology, biochemistry, obstetrics and gynecology, otolaryngology, pediatrics and pathology are offered annually for six weeks from May 15. Arrangements made by personal communication.

UNIVERSITY AND BELLEVUE HOSPITAL COLLEGE OF MEDICINE.—Various graduate courses are open for physicians as follows: research courses in anatomy, embryology, chemistry, physiology, pharmacology and therapeutics, as well as special courses in pathology, bacteriology and surgery. Clinical courses occupying about six weeks each are also offered in medicine and physical diagnosis, clinical and operative gynecology, genito-urinary diseases, laryngology, ophthalmology, pediatrics and dermatology.

OHIO

WESTERN RESERVE UNIVERSITY SCHOOL OF MEDICINE, Cleveland.—Special review courses for physicians in medicine and surgery, including some of the specialties, during May and June of each year. Courses limited to 20 men. An effort is made to occupy the physician's entire time from 8 a. m. to 5 p. m. During the remainder of the year arrangements may be made with individual instructors for advanced research work in clinical and laboratory subjects. For information address the registrar.

PENNSYLVANIA

UNIVERSITY OF PITTSBURGH SCHOOL OF MEDICINE.—A general course of instruction by lectures, clinics and demonstrations. Summer course, two weeks, beginning early in June. Fee, $50. Write to Edith S. Glenn, Secretary.

VIRGINIA

MEDICAL COLLEGE OF VIRGINIA, Richmond.—Opportunities open for a few physicians to take courses in the combined laboratories of the college of the state board of health and of the Richmond City Board of Health.

ONTARIO

UNIVERSITY OF TORONTO, FACULTY OF MEDICINE, Toronto.—Graduate courses in clinical and laboratory work are available to physicians on application. During the last season, two short courses were given for physicians, covering intensively one of the subjects of medicine, surgery, obstetrics and gynecology. The summer course in pediatrics was repeated. Several series of lectures were delivered before medical societies throughout Ontario in addition to a large number of single lectures. Physicians may register and attend by the month any of the undergraduate clinical courses of the final year.

GRADUATE MEDICAL SCHOOLS

There are now eighteen graduate medical schools in the United States. These are commonly referred to as post-graduate medical schools. Of these institutions, seven are connected with universities in which the graduate teaching is, or will be, as thoroughly and scientifically given as are the courses of the undergraduate medical school. The universities having graduate schools are the Universities of California, Tulane, Harvard, Minnesota and Pennsylvania. The University of Chicago has received a generous endowment preparatory to the establishing of a large graduate school. Active steps toward this end will be taken in the near future. Following is the complete list of graduate medical schools:

CALIFORNIA

SAN FRANCISCO POLYCLINIC AND POST-GRADUATE SCHOOL, 1535 Jackson St., San Francisco. The dean is Dr. H. D'Arcy Power.

GRADUATE SCHOOL OF MEDICINE OF THE UNIVERSITY OF CALIFORNIA, Buena Vista and Alpine St., Los Angeles. Organized 1914. Formerly the University of Southern California College of Medicine. The dean is Dr. George H. Kress.

ILLINOIS

CHICAGO POLYCLINIC, 219-221 W. Chicago Ave., Chicago. The secretary is Dr. Malcolm L. Harris, 32 N. State St.

ILLINOIS POST-GRADUATE MEDICAL SCHOOL, 1844 W. Harrison St., Chicago. The secretary is Dr. James A. Clark.

POST-GRADUATE MEDICAL SCHOOL, 2400 Dearborn St., Chicago. The secretary is Dr. Emil Ries, 77 E. Washington St.

CHICAGO EYE, EAR, NOSE AND THROAT COLLEGE, 235 W. Washington St., Chicago. The secretary is Dr. John R. Hoffman, 31 N. State St.

PROVIDENT HOSPITAL POST-GRADUATE SCHOOL, 16 W. 36th St., Chicago. For colored physicians. The dean is Dr. George C. Hall.

LOUISIANA

NEW ORLEANS POLYCLINIC. Post-Graduate School of Medicine of the Tulane University of Louisiana, Tulane Ave. and Liberty St., New Orleans. The dean is Dr. Charles L. Chassignac.

LOYOLA POST-GRADUATE SCHOOL OF MEDICINE, 1533 Tulane Ave., New Orleans. The secretary is Dr. Joseph A. Danna.

MASSACHUSETTS

HARVARD MEDICAL SCHOOL, COURSES FOR GRADUATES, 240 Longwood Ave., Boston. Organized as a separate division of the Medical School, 1912; all instructions under the charge of the Faculty of Medicine. Instruction given throughout the year. The officer in charge is the assistant dean.

MINNESOTA

UNIVERSITY OF MINNESOTA GRADUATE SCHOOL OF MEDICINE, Minneapolis. Organized 1914. In 1915, the resources and facilities of the Mayo Foundation were added, with the staff, clinics, laboratories, library and records at Rochester, Minn. A nine months' course of advanced work is offered in the science departments giving the fundamental training essential in ophthalmology and otolaryngology, will begin Sept. 28, 1922. It includes anatomy, embryology and histology of the sense organs and of the head region; physiologic optics; physiology of the special senses and of speech; pathology and bacteriology as applied to the eye, ear, nose and throat. The course includes lectures, demonstrations, quizzes and clinical work in the outpatient department. The course is limited to ten students. There are also two teaching fellowships, each available in internal medicine, surgery, obstetrics, ophthalmology and otolaryngology, pediatrics, and mental and nervous diseases. Five others are available in the laboratory sciences, and eighty-six others are available under the Mayo Foundation. Courses in various specialties leading to higher degrees in medicine (M.A., M.S., Ph.D.). Instruction throughout the year. The dean is Guy Stanton Ford, Ph.D., Minneapolis.

NEW YORK

The New York Association for Medical Education is organized to collect information regarding available graduate medical instruction; to work for the improvement of existing courses and the establishment and development of new opportunities for advanced study; to bring about an affiliation between medical schools and hospitals whose facilities have not before been utilized for teaching purposes; and to serve as a bureau of information and assistance to prospective students. The executive offices are at the Academy of Medicine Bldg., 17 W. 43d St., New York. The graduate schools are as follows:

NEW YORK POST-GRADUATE MEDICAL SCHOOL, 2d. Ave. and 20th St., New York City. The secretary is Dr. J. Bentley Squier.

NEW YORK POLYCLINIC MEDICAL SCHOOL, 341-51 W. 50th St., New York City. Is to be taken over and the work developed by Columbia University. The president is Dr. John A. Wyeth, 341 W. 50th St.

MANHATTAN EYE, EAR AND THROAT HOSPITAL AND MEDICAL SCHOOL, 210 E. 64th St., New York City. The secretary is Dr. Samuel J. Kopetzky.

SCHOOL OF OPHTHALMOLOGY AND OTOLOGY, 13th St. and 2d Ave., New York City. The secretary is Dr. George S. Rixon, 40 E. 41st St.

COLLEGE OF THE NEW YORK OPHTHALMIC HOSPITAL, 23d. St. and Third Ave., New York City. The secretary is Dr. W. C. McKnight, 13 Central Park West.

HERMAN KRAPP MEMORIAL EYE HOSPITAL, S. W. corner of 57th St. and 10th Avenue, New York City. The secretary is Gerald H. Grout.

PENNSYLVANIA

GRADUATE SCHOOL OF MEDICINE OF THE UNIVERSITY OF PENNSYLVANIA, Philadelphia. Organized 1916 by a merger with the University of the Medico-Chirurgical College of Philadelphia. The Philadelphia Polyclinic was merged in 1918. The faculty includes about 230 teachers. Courses extending over from four to twelve months in medicine, pediatrics, neurology, dermatology, syphilology, roentgenology, surgery, gynecology, obstetrics, orthopedics, urology, proctology, ophthalmology, otolaryngology and the medical sciences. Fees: Four month courses, $200; eight months, $400; twelve months, $600. Special schedules (few only), special fees. The dean is Dr. George H. Meeker.

DESCRIPTION OF MEDICAL COLLEGES

Below are given brief descriptions of the medical colleges in the United States and Canada that are legally chartered to teach medicine, several of which do not grant degrees. The name, address, year of organization, history and date when first class graduated are given in each instance. Unless otherwise stated, a class graduated each subsequent year. Where official reports have been received from the college, information regarding faculty, entrance requirements, length of term, fees, students (excluding specials and postgraduates), graduates, name of dean and next session is given without discrimination. In a few instances in which such reports were not received, the information published is from other reliable sources. Figures for graduates include all who graduated since July 1, 1921. Extract of rules and the membership of the Association of American Medical Colleges are shown following the list of colleges. Figures showing population of cities and states are taken from the United States Census Bureau's estimate for 1922. Statements have been added showing the preliminary requirements held by state licensing boards where those requirements include one or two years of collegiate work. Ten states, Alaska (Ter.), Illinois, Iowa, Michigan, New Jersey, North Dakota, Pennsylvania, Rhode Island, Texas and Washington, require also a year's hospital internship as an essential qualification for a license.

ALABAMA

Alabama, population 2,348,174, has one medical college, the School of Medicine of the University of Alabama, located in Tuscaloosa, a city with a population of 11,996.

In order to secure licenses to practice medicine in Alabama, students must complete two years of work in an approved college of liberal arts, including courses in physics, chemistry, biology and a modern language, prior to entering on the study of medicine.

Tuscaloosa

UNIVERSITY OF ALABAMA SCHOOL OF MEDICINE, University Campus, Tuscaloosa.—Organized in 1859 at Mobile as the Medical College of Alabama. Classes graduated in 1861 and subsequent years excepting 1862 to 1868, inclusive. Reorganized in 1897 as the medical department of the University of Alabama. Present title assumed in 1907, when all property was transferred to the University of Alabama. In 1920 clinical teaching was suspended and the medical school was removed to the university campus at Tuscaloosa. The course of study covers two years of thirty-four weeks each. The Dean is Dr. Clyde Brooks. Total registration for 1921-1922 was 62. The fifty-seventh session begins Sept. 4, 1922, and ends May 22, 1923.

ARKANSAS

Arkansas, population 1,752,204, has one medical college, the Medical Department of the University of Arkansas, located in Little Rock, a city of 65,142.

To secure licenses to practice medicine in Arkansas, students must complete two years of collegiate work, including college courses in physics, chemistry, biology and a modern language, before beginning the study of medicine.

Little Rock

UNIVERSITY OF ARKANSAS MEDICAL DEPARTMENT, Markham and Center Streets.—Organized in 1879 as the Medical Department of Arkansas Industrial University. It assumed the present title in 1899. In 1911 the College of Physicians and Surgeons united with it and the new school was made an integral part of the University of Arkansas. The first class was graduated in 1880. Clinical teaching was temporarily suspended in 1918. The faculty consists of 13 professors and 7 lecturers and assistants, total 20. Instruction in the junior year will be resumed at the session of 1922-1923, and in the senior year at the beginning of the session of 1923-1924. Entrance requirements are two years of collegiate work in addition to a four-year high school course. The course of study covers two years of thirty-four weeks each. The fees are $50 each year. The Dean is Dr. Morgan Smith. Total registration 1921-1922 was 34. The forty-fourth session begins Sept. 20, 1922, and ends June 7, 1923.

CALIFORNIA

California, population 3,426,861, has three medical colleges. Two are located in San Francisco, a city of 506,676 inhabitants. They are Stanford University School of Medicine and the College of Medicine of the University of California. The College of Medical Evangelists is located at Loma Linda and Los Angeles, the latter city having a population of 576,673.

To secure licenses to practice medicine in California under the "physician's and surgeon's" certificate, students must complete at least one year of recognized collegiate work including college courses in physics, chemistry, biology and a modern language before beginning the study of medicine.

Berkeley-San Francisco

UNIVERSITY OF CALIFORNIA MEDICAL SCHOOL, University Campus, Berkeley; Second and Parnassus Avenues, San Francisco.—Organized in 1863 as the Toland Medical College. The first class graduated in 1864. In 1872 it became the Medical Department of the University of California. In 1909 the College of Medicine of the University of Southern California, at Los Angeles, by legislative enactment, became a clinical department. This Los Angeles portion was changed to a graduate school in 1914. In 1915 the Hahnemann Medical College of the Pacific was merged, and elective chairs in homeopathic materia medica and therapeutics were provided. Three years of collegiate work are required for admission. The work of the first year and a half is given at Berkeley and the work of the last two and a half years at San Francisco. The faculty is composed of 57 professors and 130 associates and assistants, a total of 187. The course covers five years of eight months each, the fifth year to consist of an internship or of special work in a department of the medical school. Fees for the four years, respectively, for residents of California or $290, $248, $235 and $225; nonresidents are charged $300 additional each year. Total registration for 1921-1922 was 233, graduates 41. The fiftieth session begins Aug. 2, 1922, and ends May 16, 1923.

Loma Linda-Los Angeles

College of Medical Evangelists.—Organized in 1909. The faculty numbers 109. The first class graduated in 1914. The laboratory departments are at Loma Linda; the clinical departments at Los Angeles. The faculty is composed of 55 professors and 82 associates and assistants, a total of 137. The course extends over four years of nine months each. Two years of college work are required for admission. The total fees for the four years, respectively, are $236, $231, $211 and $221. The President is Dr. Newton Evans, Loma Linda, Calif., and the Dean is Dr. P. T. Magan, Los Angeles. The total registration for 1921-1922 was 198; graduates, 23. This college taught also 14 students of the College of Physicians and Surgeons of Los Angeles, all of whom obtained degrees from the latter college, and one student of the College of Physicians and Surgeons of San Francisco, who was granted a degree from the last-named institution. The fourteenth session begins Sept. 3, 1922, and ends May 24, 1923.

San Francisco-Palo Alto

Stanford University School of Medicine, University Campus, Palo Alto, and Sacramento and Webster Streets, San Francisco.—Organized in 1908 when, by an agreement, the interests of Cooper Medical College were taken over. The first class was graduated in 1913. The faculty consists of 73 professors and 43 lecturers, assistants, etc., a total of 116. Three years of collegiate work are required for admission. The school has the quarter system and the completion of any three quarters constitutes a college year. The course covers five years of nine months each, including a year of practical or intern work. The total fees for each of the first four years are, respectively, $264, $264, $186 and $186. The Dean is Dr. W. Ophüls, San Francisco. The total registration for 1921-1922 was 167; graduates 28. The thirteenth session begins Oct. 2, 1922, and ends June 18, 1923.

COLORADO

Colorado, with a population of 939,629, has one medical college, the University of Colorado School of Medicine. The first two years of the course are given at Boulder, the seat of the university, while the last two, or clinical years, are given in Denver, which has a population of 256,491.

The Colorado State Board of Medical Examiners will register without further examination graduates of medical colleges in good standing who present licenses issued after examination by any other licensing board. The law permits any one, graduate or nongraduate, to try the board's written examination.

Boulder-Denver

University of Colorado School of Medicine.—Organized in 1883. Classes were graduated in 1885 and in all subsequent years except 1898 and 1899. Denver and Gross College of Medicine was merged Jan. 1, 1911. The faculty embraces 37 professors and 28 lecturers, instructors and assistants, a total of 65. The work embraces a graded course of four years of nine months each. The entrance requirements are two years of college work counting toward a degree in arts in an accredited college or university. The fees for residents of Colorado, for each of the four years, are, respectively, $139, $139, $100, $100, and $30 more each year for nonresidents. The Dean is Dr. Charles N. Meader. The total registration for 1921-1922 was 100, graduates, 15. The forty-first session begins Sept. 25, 1922, and ends June 11, 1923.

CONNECTICUT

Connecticut, with a population of 1,380,631, has one medical college, Yale University School of Medicine, located in New Haven, population 162,537.

Students who desire to practice medicine in Connecticut will not be eligible unless, prior to entering the study of medicine, they complete, in addition to an accredited four-year high school education, at least nine months of collegiate work including college courses in physics, chemistry and general biology.

New Haven

Yale University School of Medicine, 150 York Street and at corner Congress Avenue and Cedar Street.—Chartered in 1810 as the Medical Institution of Yale College. Organized in 1812; instruction began in 1813; first class graduated in 1814. A new charter in 1879 changed the name to the Medical Department of Yale College. In 1884, the Connecticut Medical Society surrendered such authority as had been granted by the first charter. In 1887, Yale College became Yale University. The faculty consists of 24 professors and 94 lecturers and assistants, a total of 118. The requirements for admission are three years of collegiate work plus evidence of satisfactory completion of courses in general physics, general inorganic chemistry, general biology, organic chemistry and physical chemistry or laboratory physics, all reasonably equivalent to the courses in these subjects in Yale University. The student also must have two years of French or German. The course covers four years of nine months each. The fees for the four years, respectively, are $305, $300, $300 and $320. The Dean is Dr. Milton C. Winternitz. The total registration for 1921-1922 was 165, graduates, 23. The one hundred and tenth session begins Sept. 28, 1922, and ends June 20, 1923.

DISTRICT OF COLUMBIA

The District of Columbia, population 437,571, has three medical colleges: George Washington University Medical School, Georgetown University School of Medicine and Howard University School of Medicine.

Washington

George Washington University Medical School, 1335 H Street, N.W.—Organized in 1825 as the Medical Department of Columbian College. Also authorized to use the name National Medical College. Classes were graduated in 1826 and in all subsequent years, except 1834 to 1838, and 1861 to 1863, inclusive. The original title was changed to Medical Department of Columbian University in 1873. In 1903 it absorbed the National University Medical Department. In 1904, by an act of Congress, the title of George Washington University was granted to the institution. The faculty is composed of 48 professors and 54 instructors, demonstrators and assistants, a total of 102. Two years of collegiate work are required for admission. The course covers four years of thirty-four weeks each. The fees for the four years, respectively, are $231, $228, $228 and $218. The Dean is Dr. William C. Borden. The total registration for 1921-1922 was 149, graduates, 15. The one hundredth session begins Sept. 27, 1922, and ends June 6, 1923.

Georgetown University School of Medicine, 920 H Street, N.-W.—Organized in 1851. The first class graduated in 1852. The faculty contains 55 professors, 40 instructors and assistants; total, 95. Two years of collegiate work are required for entrance. The course of study covers four terms of eight and one half months each. The fees for each of the four sessions, respectively, are $215, $200, $200 and $210. The Dean is Dr. George M. Kober. The registration for 1921-1922 was 204; graduates, 22. The seventy-second session begins Sept. 27, 1922, and ends June 12, 1923.

Howard University School of Medicine, Fifth and W Streets, N.-W.—Chartered in 1867. Organized in 1869. The first class graduated in 1871. Colored students compose a majority of those in attendance. The faculty comprises 17 professors and 25 lecturers and assistants, 42 in all. The admission requirements are two years of collegiate work, including physics, chemistry, botany and zoology, English and two years of French or German. The course covers four years of thirty-three weeks each. The fees of each of the four sessions, respectively, are $163, $158, $158 and $165. The Dean is Dr. Edward A. Balloch. Registration for 1921-1922 was 199; graduates, 22. The fifty-fifth session begins Oct. 2, 1922, and ends June 8, 1923.

GEORGIA

Georgia, population 2,895,832, has two medical colleges, University of Georgia Medical Department, located in Augusta, population 52,548, and the Emory University School of Medicine in Atlanta, a city of 200,616.

In order to secure a license to practice medicine in Georgia, students must complete two years of work in an approved college of liberal arts and sciences, including courses in physics, chemistry and biology, prior to entering on the study of medicine.

Atlanta

Emory University School of Medicine, 98 N. Butler Street.—Organized in 1854. Classes graduated 1855 to 1861, when it suspended. Reorganized in 1865. A class graduated in 1865 and each subsequent year except 1874. In 1898 it merged with the Southern Medical College (organized in 1878), taking the name of Atlanta College of Physicians and Surgeons. In 1913 it merged with the Atlanta School of Medicine (organized in 1905), reassuming the name of Atlanta Medical College. Became the Medical Department of Emory University in 1915; assumed present title in 1917. Two years of collegiate work are required for admission. The faculty has 18 professors and 93 associates and assistants, a total of 111. The course of study is four years of thirty-four weeks each. The fees for each of the four years, respectively, are $240, $220, $215 and $243. The Dean is Dr. W. S. Elkin. Total registration for 1921-1922 was 220; graduates, 50. The next session begins Sept. 27, 1922, and ends June 5, 1923.

Augusta

University of Georgia Medical Department, University Place.—Organized in 1828 as the Medical Academy of Georgia, the name being changed to the Medical College of Georgia in 1829. Since 1873 it has been known as the Medical Department of the University of Georgia. Entire property transferred to the university in 1911. Classes were graduated in 1833 and in all subsequent years except 1862 and 1863. The faculty includes 19 professors and 34 assistants, 53 in all. Two years of collegiate work are required for entrance. The course is four years of thirty-four weeks each. Fees are $5 for matriculation and $60 each year for residents of Georgia and $150 each year for nonresidents. The Dean is Dr. W. H. Doughty, Jr. The total registration for 1921-1922 was 89; graduates, 13. The ninety-first session begins Sept. 14, 1922, and ends May 28, 1923.

ILLINOIS

Illinois, population 6,485,280, has six medical colleges, one of which gives instruction at night, all located in Chicago, a city of 2,701,705 inhabitants. They are as follows: Rush Medical College, Northwestern University Medical School, University of Illinois College of Medicine, Loyola University

School of Medicine, Hahnemann Medical College and the Chicago Medical School.

To be eligible for license to practice medicine in Illinois, students must complete two years of collegiate work including courses in physics, chemistry, biology and a modern language before entering on the study of medicine. Graduates of 1923 and thereafter must complete also a year's internship in a hospital.

Chicago

RUSH MEDICAL COLLEGE.—Founded in 1837; organized in 1843; was the medical department of Lake Forest University from 1887 until 1898, when it became affiliated with the University of Chicago. The first class graduated in 1844. The faculty is composed of 109 professors, 135 associates, instructors, etc., a total of 244. The requirements for admission are two years of college work, including courses in college chemistry, physics and biology, and a reading knowledge of German or French. Three years of college work will be required beginning with the Autumn Quarter of 1922. Classes are limited to 100 students in each of the freshman and sophomore classes, and to 120 students in each of the clinical years. No application for admission is accepted after September 1. The school operates under the "quarter system" in which the year is divided into four quarters of twelve weeks each; the completion of the work of three of these quarters gives credit for a college year. The course covers four years of eight and a half months each, and a fifth year, consisting of a hospital internship or of a fellowship in one of the departments. All freshman and sophomore studies are given at the University of Chicago. The clinical years are given in the building at the corner of Wood and Harrison Streets. The tuition fees for each of the four years, respectively, are $235, $225, $225 and $245. The Deans are Dr. Frank Billings and Dr. John M. Dodson. Total registration for 1921-1922 was 712; graduates, 137. The seventy-ninth session begins Oct. 2, 1922, and ends June 16, 1923.

NORTHWESTERN UNIVERSITY MEDICAL SCHOOL, 2421 South Dearborn Street.—Organized in 1859 as the Medical Department of Lind University. First class graduated in 1860. In 1864 it became independent as the Chicago Medical College. It united with Northwestern University in 1869, but retained the name of Chicago Medical College until 1891, when the present name was taken. Became an integral part of Northwestern University in 1905. The faculty comprises 68 professors and 97 lecturers and assistants, a total of 165. The requirements for admission are such as will admit to the College of Liberal Arts of Northwestern University, plus two years of college work, including courses in physics, chemistry, biology and a modern language. The course covers four years of eight months each. The fees for the four years, respectively, are $220, $220, $216 and $210. The Dean is Dr. Arthur I. Kendall. The total registration for 1921-1922 was 451; graduates, 78. The sixty-third session begins Oct. 3, 1922, and ends June 16, 1923.

UNIVERSITY OF ILLINOIS COLLEGE OF MEDICINE, 508 S. Honore Street.—Organized in 1882 as the College of Physicians and Surgeons. The first class graduated in 1883. It became the Medical Department of the University of Illinois by affiliation in 1897 and an integral part in 1910. The relationship with the university was canceled in June, 1912, but restored in March, 1913, when the present title was assumed. Two years of collegiate work are required for admission. The curriculum covers four years of thirty-three weeks each, and a year's internship in an approved hospital. The faculty is composed of 67 professors, 100 assistants and instructors, a total of 167. The total fees are $165 each year for resident students and $35 more for nonresidents. The Dean is Dr. Albert C. Eycleshymer. The total registration for 1921-1922 was 421; graduates, 48. The forty-first session begins Oct. 2, 1922, and ends June 19, 1923.

LOYOLA UNIVERSITY SCHOOL OF MEDICINE, 706 S. Lincoln St., Chicago.—Organized in 1868 as the Bennett College of Eclectic Medicine and Surgery. Eclecticism dropped and title of Bennett Medical College assumed in 1909. First class graduated in 1870, and a class graduated each subsequent year. Absorbed the Illinois Medical College in 1910 and the Reliance Medical College in 1911. In 1910 it became by affiliation the School of Medicine of Loyola University; the university assumed full control in 1915. Took over by purchase the Chicago College of Medicine and Surgery in 1917. Two years of college work are required for admission. The faculty is composed of 65 professors, 72 assistants and instructors, a total of 137. The total fees for the four years are, respectively, $250, $250, $250 and $275. The Dean is Dr. Louis D. Moorhead. The total enrolment for 1921-1922 was 231; graduates, 64. The next session begins Oct. 2, 1922, and ends June 16, 1923.

HAHNEMANN MEDICAL COLLEGE OF CHICAGO, 2811 Cottage Grove Avenue.—Organized in 1859. The first class was graduated in 1861. Absorbed the Chicago Homeopathic Medical College in 1904. The faculty includes 44 professors and 39 lecturers, assistants, etc., a total of 83. Two years of collegiate work are required for admission. The course extends over four years of thirty-five weeks each. The tuition fees for each of the years is $200. The Dean is Dr. John C. Blake. The total registration for 1921-1922 was 110; graduates, 13. The sixty-third session begins Sept. 25, 1922, and ends June 14, 1923.

CHICAGO MEDICAL SCHOOL, an afternoon and night school, located at 3832 Rhodes Avenue.—Organized in 1911 as the Chicago Hospital College of Medicine; chartered in 1912. In December, 1917, the classes of the Jenner Medical College were transferred to it. Total registration for 1921-1922 was 175; graduates, 50. *Official reports state that the diplomas from this college are not recognized by the licensing boards of forty-five states.*

INDIANA

Indiana, population 2,930,390, has one medical college, the Indiana University School of Medicine, located at Indianapolis, a city of 314,194 people, except that the work of the first year is offered also at Bloomington, the seat of the University.

Students who intend to practice medicine in Indiana must complete two years of collegiate work, in addition to an accredited four-year high school course, prior to beginning the study of medicine.

Bloomington and Indianapolis

INDIANA UNIVERSITY SCHOOL OF MEDICINE.—Organized in 1903, but did not give all of the work of the first two years of the medical course until 1905. In 1907, by union with the State College of Physicians and Surgeons, the complete course in medicine was offered. In 1908 the Indiana Medical College, which was formed in 1905 by the merger of the Medical College of Indiana (organized in 1878), the Central College of Physicians and Surgeons (organized in 1879), and the Fort Wayne College of Medicine (organized in 1879), merged into it. The first class was graduated in 1908. The faculty consists of 64 professors and 100 lecturers, associates and assistants, a total of 164. Two years of collegiate work are required for admission. The work of the first year is emphasized only at Bloomington. The work of the other three years is all at Indianapolis. The fees for the four years, respectively, are $125, $125, $150 and $150. Matriculation fee, $5; microscope fee, $5 to $7.50 per semester. A fifth optional intern year leading to the "M.D. cum laude" has been added. The Assistant Dean at Bloomington is Dr. B. D. Myers; the Dean is Dr. Charles P. Emerson, Indianapolis. The total registration for 1921-1922 was 274; graduates, 33. The next session begins Sept. 11, 1922, and ends June 6, 1923.

IOWA

Iowa, population 2,404,021, has one medical college, the College of Medicine of the State University of Iowa, located in Iowa City, population 11,267.

Students who desire to practice medicine in Iowa must complete two years of work in an approved college of liberal arts prior to beginning the study of medicine, this preliminary college work to have included courses in physics, chemistry, biology and a foreign language.

Iowa City

STATE UNIVERSITY OF IOWA COLLEGE OF MEDICINE, University Campus.—Organized in 1869. First session began in 1870. First class graduated in 1871. Absorbed Drake University College of Medicine in 1913. The faculty is made up of 30 professors, 44 lecturers, demonstrators and assistants, a total of 74. Two years of collegiate work, including courses in physics, chemistry, biology, French or German and English, are required for admission. The course of study covers four years of thirty-four weeks each. The tuition fee for residents of Iowa is $150 per year and for nonresidents $175, plus a matriculation fee of $10 and a graduation fee of $10. The Dean is Dr. Lee Wallace Dean, Iowa City. Total registration for 1921-1922 was 313; graduates, 38. The fifty-third session begins Sept. 25, 1922, and ends June 5, 1923.

KANSAS

Kansas, population 1,769,257, has one medical college. The School of Medicine of the University of Kansas gives its first two years in Lawrence, population 12,456, and the last two years in Rosedale, a suburb of Kansas City, which with Kansas City, Mo., have a combined population of 433,261.

Students who desire to practice medicine in Kansas must complete at least two years of collegiate work including college courses in physics, chemistry and biology in addition to an accredited four-year high school course.

Lawrence and Rosedale

UNIVERSITY OF KANSAS SCHOOL OF MEDICINE.—Organized in 1880. It offered only the first two years of the medical course until in 1905, when it merged with the Kansas City (Mo.) Medical College, founded in 1869, the College of Physicians and Surgeons, founded in 1894, and the Medico-Chirurgical College, founded in 1897. First class graduated in 1906. The clinical courses are given at Rosedale. Absorbed Kansas Medical College in 1913. The faculty, including lecturers and clinical assistants, numbers 62. The requirements for admission are two years of collegiate work. The course covers four years of nine months each. The total fees for residents of the state for each of the four years are, respectively, $131, $131, $133 and $133. For nonresidents the fees of the first two years are $141 each year. The Associate Dean is Dr. M. D. Sudler. The total registration for 1921-1922 was 157; graduates, 24. The forty-third session begins Sept. 11, 1922, and ends June 4, 1923.

KENTUCKY

Kentucky, population 2,416,630, has one medical college, the University of Louisville Medical Department, situated in Louisville, a city of 234,891 inhabitants.

To be eligible for license to practice medicine in Kentucky, students must complete two years of college work, including courses in physics, chemistry, biology and a modern language prior to beginning the study of medicine.

Louisville

UNIVERSITY OF LOUISVILLE MEDICAL DEPARTMENT, First and Chestnut Streets.—Organized in 1837 as the Louisville Medical Institute. The first class graduated in 1838, and a class graduated in each subsequent year except in 1863. In 1846 the present name was assumed. In 1907 it absorbed the Kentucky University Medical Department. In 1908 it absorbed the Louisville Medical College, the Hospital College of Medicine and the Kentucky School of Medicine. Two years of collegiate work are required for admission. It has a faculty of 29 professors and 90 lecturers and assistants, a total of 119. The course covers four years of thirty-four weeks each. The fees for the four years, respectively, are $265, $265, $272 and $292. The Dean is Dr. Henry Enos Tuley. The total registration for 1921-1922 was 163; graduates, 21. The next session begins Sept. 19, 1922, and ends June 4, 1923.

LOUISIANA

Louisiana, having a population of 1,798,509, contains one medical college, the School of Medicine of the Tulane University of Louisiana, situated in New Orleans, a city of 387,219.

Students who desire to practice medicine in Louisiana must complete, at an approved college or university, two years of college work, including biology, physics, chemistry and a modern language, before entering on the study of medicine.

New Orleans

TULANE UNIVERSITY OF LOUISIANA SCHOOL OF MEDICINE, University Campus and 1551 Canal Street.—Organized in 1834 as the Medical College of Louisiana. Classes were graduated in 1835 and in all subsequent years except 1863-1865, inclusive. It was transferred to the Medical Department of the University of Louisiana in 1847 and became the Medical Department of the Tulane University of Louisiana in 1884. Present name in 1913, when it became the School of Medicine of the College of Medicine of the Tulane University of Louisiana. The faculty has 36 professors and 112 assistant professors, instructors, demonstrators, etc., a total of 148. The course covers four years of thirty-four weeks each. Two years of collegiate work are required for admission. Total fees for each of the four years, respectively, are $225, $225, $215 and $245. The Dean is Dr. Charles C. Bass. The total registration for 1921-1922 was 340; graduates, 71. The eighty-eighth session begins Sept. 22, 1922, and ends June 6, 1923.

MARYLAND

Maryland, with a population of 1,449,661, contains two medical colleges, located in Baltimore, a city with 733,826 inhabitants. They are as follows: Johns Hopkins University Medical Department, and the University of Maryland School of Medicine and College of Physicians and Surgeons, the last two having been merged.

To be eligible to practice medicine in Maryland, students, in addition to a four-year high school education, must complete at least two years of college work including courses in physics, chemistry, biology and French or German, prior to beginning the study of medicine.

Baltimore

JOHNS HOPKINS UNIVERSITY MEDICAL DEPARTMENT, Washington and Monument Streets.—Organized in 1893. The first class graduated in 1897. The faculty consists of 52 professors and 153 clinical professors, etc., a total of 205. The requirements for admission demand that the applicant either has (*a*) completed the chemical-biologic course which leads to the A.B. degree in the university, or (*b*) graduated at an approved college or scientific school and has a knowledge of French and German (two years each of college instruction), physics and biology, such as may be obtained from a year's course, and a three years' course in chemistry. The course extends over four years of eight and one-half months each. The total fees for each of the four years are, respectively, $317, $267, $267, $267. The Dean is Dr. J. Whitridge Williams. Total registration for 1921-1922 was 349; graduates, 80. The thirtieth session begins Oct. 2, 1922, and ends June 12, 1923.

UNIVERSITY OF MARYLAND SCHOOL OF MEDICINE AND THE COLLEGE OF PHYSICIANS AND SURGEONS, Lombard and Greene Streets.—Organized in 1807 as the College of Medicine of Maryland. The first class graduated in 1810. In 1812 it became the University of Maryland School of Medicine. Baltimore Medical College was merged into it in 1913. In 1915 the College of Physicians and Surgeons was merged and the present name assumed. The faculty consists of 83 professors and 103 instructors and assistants, a total of 186. Two years of collegiate work are required for admission. The course covers four years of eight months each. The total fees are $265 each year. The Dean is Dr. J. M. H. Rowland. Total registration for 1921-1922 was 299; graduates, 55. The one hundred and sixteenth session begins Oct. 2, 1922, and ends June 9, 1923.

MASSACHUSETTS

Massachusetts, population 3,852,356, has five medical colleges: Medical School of Harvard University, Boston University School of Medicine, Tufts College Medical School, College of Physicians and Surgeons and the Middlesex College of Medicine and Surgery. They are all situated in Boston, a city of 748,060, except the last named, which is in Cambridge, a city of 109,694.

Boston

MEDICAL SCHOOL OF HARVARD UNIVERSITY, 240 Longwood Avenue.—Organized in 1782. The first class graduated in 1788. It has a faculty of 74 professors and 207 instructors and assistants, a total of 281. Candidates for admission must present a college degree or two years of work leading to such a degree with standing in the upper third of the class. The college work must include a year of physics, biology, general chemistry, a half year of organic chemistry, and a reading knowledge of French or German. The total fees for each of the four years are $305, $300, $300 and $300. The Dean is Dr. David L. Edsall. The total registration for 1921-1922 was 471; graduates, 112. The one hundred and forty-first session begins Sept. 25, 1922, and ends June 21, 1923.

BOSTON UNIVERSITY SCHOOL OF MEDICINE, 80 East Concord Street.—Organized in 1873. In 1874 the New England Female Medical College, founded in 1848, was merged into it. The first class graduated in 1874. Became nonsectarian in 1918. Two years of collegiate work are required for admission. The faculty includes 22 professors, 71 associates, etc., making a total of 93. The course covers four years of thirty-five weeks each. Total fees for each of the four years, respectively, are $260, $230, $230 and $240. The Dean is Dr. John P. Sutherland. Total registration for 1921-1922 was 161; graduates, 24. The fiftieth session begins Sept. 28, 1922, and ends June 18, 1923.

TUFTS COLLEGE MEDICAL SCHOOL, 416 Huntington Avenue.—Organized in 1893 as the Medical Department of Tufts College. The first class graduated in 1894. It has a faculty of 48 professors and 97 assistants, lecturers, etc., a total of 145. Two years of collegiate work are required for admission. The course covers four years of eight months each. The total fees for each of the four years are $260, $245, $235 and $240. The Acting Dean is Dr. Frank G. Wheatley. Total registration for 1921-1922 was 442; graduates, 83. The twenty-seventh session begins Sept. 27, 1922, and ends May 29, 1923.

COLLEGE OF PHYSICIANS AND SURGEONS, 517 Shawmut Avenue.—Organized in 1880. The first class graduated in 1882. Total attendance of medical students during 1921-1922 was about 70. There were 19 graduates. *This college has been reported not recognized by the Massachusetts Medical Society and by the licensing boards of forty-five states.*

Cambridge

MIDDLESEX COLLEGE OF MEDICINE AND SURGERY, Cambridge.—Organized in 1914 under the charter of the Worcester Medical College, which became extinct in 1859. A class was graduated in 1915 and each subsequent year. Was closely related in its interests with an osteopathic college and granted a liberal advanced standing for work done in that and other osteopathic colleges. During 1921-1922 it had a total enrolment of 121; graduates, 27. *This college has been reported as not recognized by the licensing boards of forty-six states.*

MICHIGAN

Michigan, population 3,668,412, has two medical colleges. The University of Michigan Medical School is located at Ann Arbor, a city of 19,516 people. The Detroit College of Medicine and Surgery is located at Detroit, a city of 993,678 inhabitants. Students who desire to practice medicine in Michigan, in addition to an accredited four-year high school education, must complete two years of work in an approved college of liberal arts, including college courses in physics, chemistry, biology and French or German, prior to beginning the study of medicine.

Ann Arbor

UNIVERSITY OF MICHIGAN MEDICAL SCHOOL.—Organized in 1850 as the University of Michigan Department of Medicine and Surgery. The first class graduated in 1851. Present title assumed in 1915. It has a faculty composed of 16 professors and 92 associates, instructors, etc., a total of 108. The entrance requirements are two years of college work, including courses in chemistry, physics and biology, with laboratory work, and a reading knowledge of one modern language. The curriculum embraces four years of nine months each. The total fees for Michigan students are $140 each year and $200 for nonresidents. The matriculation fee for residents is $10; for nonresidents, $25. The Dean is Dr. Hugh Cabot. The total registration for 1921-1922 was 558; graduates, 67. The seventy-third session begins Sept. 25, 1922, and ends June 18, 1923.

Detroit

DETROIT COLLEGE OF MEDICINE AND SURGERY, 1516 St. Antoine St.—Organized as the Detroit College of Medicine in 1885 by consolidation of Detroit Medical College, organized in 1868, and the Michigan College of Medicine, organized in 1880. Reorganized with present title in 1913. The first class graduated in 1886. In 1918 it became a municipal institution under the control of the Detroit Board of Education. Entrance requirements are two years of collegiate work. The faculty embraces 23 professors, 176 lecturers, etc., a total of 199. The course covers five years of nine months each (including the hospital intern year). The total fees each year are $150—if residents of Detroit the fees are $25. The Dean is Dr. W. H. MacCraken. The total registration for 1921-1922 was 166; graduates, 23. The thirty-eighth session begins Oct. 2, 1922, and ends June 16, 1923.

MINNESOTA

Minnesota, population 2,387,125, contains one medical school, the University of Minnesota Medical School, situated in Minneapolis, a city of 380,582 inhabitants.

Students intending to practice medicine in Minnesota, in addition to an accredited four-year high school education, must complete two years of college work the equivalent of that done in the liberal arts department of the University of Minnesota, including courses in physics, chemistry and biology, prior to beginning the study of medicine.

Minneapolis

UNIVERSITY OF MINNESOTA MEDICAL SCHOOL.—Organized in 1883 as the University of Minnesota College of Medicine and Surgery, reorganized in 1888 by absorption of St. Paul Medical College and Minnesota Hospital College. The first class graduated in 1889. In 1908 the Minneapolis College of Physicians and Surgeons, organized in 1883, was merged. In 1909 the Homeopathic College of Medicine and Surgery was merged. Present title in 1913. The faculty includes 115 professors and 122 instructors and assistants, a total of 237. The curriculum covers four years of nine months each, and a year's internship in an approved hospital. The school is operated on the four-quarter plan. The entrance requirements are two years of university work, which must include six semester credits of rhetoric, eight semester credits of physics; twelve credits of general chemistry, qualitative analysis and organic chemistry; eight credits of zoology, and a reading knowledge of French or German. Students are required to secure a degree of B.S. or A.B. before receiving the degree of Bachelor of Medicine (M.B.) which is granted at the end of the four-year course. The M.D. is conferred after a year of intern work or of advanced laboratory work has been completed. Classes are graduated twice a year, in June and in December. Total fees are $199 for residents and $229 for non-residents, each year of three quarters. The Dean is Dr. E. P. Lyon. The total registration for 1921-1922 was 399; graduates, 80. The thirty-fourth session begins Sept. 27, 1922, and ends June 20, 1923. The summer quarter begins June 26.

MISSISSIPPI

Mississippi, population 1,790,618, has one medical college, the Department of Medicine of the University of Mississippi, which is located at Oxford, a city of 2,150 inhabitants.

Students desiring to practice medicine in Mississippi, in addition to a standard four-year high school education, must complete two years of work in an approved college or university, including courses in physics, chemistry, biology and a modern language, before entering on the study of medicine.

Oxford

UNIVERSITY OF MISSISSIPPI SCHOOL OF MEDICINE.—Organized in 1903. Gives only the first two years of the medical course. In 1908 a clinical department was established at Vicksburg, but was discontinued in 1910 after graduating one class. The session extends over eight and a half months. Entrance requirements are two years of collegiate work. The total fees each year are $140. The faculty numbers 18. The Dean is Dr. W. S. Leathers. The total registration for 1921-1922 was 54. The twentieth session begins Sept. 20, 1922, and ends June 5, 1923.

MISSOURI

Missouri, population 3,404,055, has six medical colleges. St. Louis, population 772,897, contains three of these, viz., the School of Medicine of St. Louis University, Washington University Medical School, and the St. Louis College of Physicians and Surgeons. Kansas City, which, with Kansas City, Kansas, has a population of 433,261, has two colleges, the Kansas City College of Medicine and Surgery and the Kansas City University of Physicians and Surgeons, neither of which is approved as reputable by the Missouri State Board of Health. The School of Medicine of the University of Missouri is at Columbia, a town of 10,392 people.

Columbia

UNIVERSITY OF MISSOURI SCHOOL OF MEDICINE.—Organized at St. Louis in 1845; was discontinued in 1855, but was reorganized at Columbia in 1872. Teaching of the clinical years was suspended in 1909. The faculty includes 11 professors and 20 assistant professors, lecturers, etc., a total of 31. The course covers two years of thirty-two weeks each. The entrance requirements are two years of college work including French or German, 8 hours; general zoology, 8 hours; physics, 8 hours; inorganic chemistry, 8 hours; organic chemistry, 5 hours, and general bacteriology, 3 hours. Total fees are $100 for each year. Nonresidents of the state pay $10 per term extra. The Dean is Dr. Guy L. Noyes. Total registration for 1921-1922 was 84. The next session begins Aug. 29, 1922, and ends April 25, 1923.

Kansas City

KANSAS CITY COLLEGE OF MEDICINE AND SURGERY, Twenty-Third and Holmes Streets.—Organized in 1915 as an offshoot of the Eclectic Medical University, a Class C medical school, now extinct. It claims to be an eclectic college, but is reported not recognized as such by the National Eclectic Medical Association. Total registration for 1921-1922 was about 90; graduates, 14. Since this school is an offshoot of a Class C medical college and is *reported not recognized by the Missouri State Board of Health and by the licensing boards of forty-two other states*, no higher rating can be granted to it, pending an inspection, which it has refused.

KANSAS CITY UNIVERSITY OF PHYSICIANS AND SURGEONS, 729 Troost Street.—Originally chartered in 1903 as the Central College of Osteopathy; charter amended in 1917, by which it obtained the right to grant degrees in medicine, and the name was changed to the Central College Medical Department. Present title in 1918. Very liberal advanced standing allowed for work done in osteopathic colleges, and it still has osteopathic classes. Total enrolment in 1921-1922 was 80; graduates, 32. Rated in Class C by the Council on Medical Education. *Reported not recognized by the licensing boards of Missouri and of forty-seven other states.*

St. Louis

WASHINGTON UNIVERSITY SCHOOL OF MEDICINE, Kingshighway and Euclid Avenue.—Organized in 1842 as the Medical Department of St. Louis University. In 1835 it was chartered as an independent institution under the name of St. Louis Medical College. The first class graduated in 1843. In 1891 it became the Medical Department of Washington University. In 1899 it absorbed the Missouri Medical College. The faculty comprises 38 professors and 110 lecturers, instructors, etc., a total of 148. Two years of college work are required for admission, including courses in English, physics, chemistry and biology, and a reading knowledge of German or French. The course is four years of eight months each. The total fees for the four years are, respectively, $315, $210, $210 and $215. The Dean is Dr. Nathaniel Allison. The total registration for 1921-1922 was 235; graduates, 48. The next session begins Sept. 28, 1922, and ends June 14, 1923.

ST. LOUIS UNIVERSITY SCHOOL OF MEDICINE, 1402 South Grand Avenue.—Organized in 1901 as the Marion-Sims-Beaumont Medical College by union of Marion Sims Medical College, organized in 1890, and Beaumont Hospital Medical College, organized in 1886. First class graduated in 1902. It became the Medical Department of St. Louis University in 1903. The faculty is composed of 61 professors and 102 lecturers and assistants, a total of 163. Two years of collegiate work are required for admission. The curriculum covers four years of thirty-two weeks each. The summer season is optional. The total fees are $250 each year. The Dean is Dr. Hanau W. Loeb. The total registration for 1921-1922 was 303; graduates, 39. The next session begins Oct. 2, 1922, and ends June 1, 1923.

ST. LOUIS COLLEGE OF PHYSICIANS AND SURGEONS, Jefferson and Gamble Streets.—Organized in 1869. Classes graduated in 1870 and each subsequent year until 1873, when it suspended. Reorganized in 1879. Classes graduated in 1880 and subsequent years until 1915, when it merged with the Medical Department of the National University of Arts and Sciences. Reestablished in 1916. Registration during 1921-1922 was 120; graduates, 34. *This college is reported as not recognized by the licensing boards of Missouri and forty-seven other states.*

NEBRASKA

Nebraska, population 1,296,372, has two medical colleges, the University of Nebraska College of Medicine and the Creighton University College of Medicine, both in Omaha, population 191,601.

Omaha

CREIGHTON UNIVERSITY COLLEGE OF MEDICINE, Fourteenth and Davenport Streets.—Organized in 1892 as the John A. Creighton Medical College. Present title in 1921. The first class graduated in 1893. It has a faculty of 25 professors and 43 instructors, lecturers and assistants, a total of 68. Two years of collegiate work are required for admission. The course of study embraces four years of eight months each. Continuous session adopted for seniors only. The total fees each year for the four years are, respectively, $180, $170, $170 and $180. The Dean is Dr. Hermann von W. Schulte. Total registration for 1921-1922 was 138; graduates, 20. The forty-first session begins Sept. 20, 1922, and ends June 2, 1923.

UNIVERSITY OF NEBRASKA COLLEGE OF MEDICINE, Forty-Second Street and Dewey Avenue.—Organized in 1881 as the Omaha Medical College. The first class graduated in 1882. It became the Medical Department of Omaha University in 1891. In 1902 it affiliated with the University of Nebraska, with the present title. The first two years were given at Lincoln and the last two in Omaha until 1913, when all four years were transferred to Omaha. The faculty is composed of 25 professors and 48 lecturers and instructors, total 73. Two years of collegiate work are required for admission, including courses in physics, chemistry and zoology. The fees for each of the four years, respectively, are $145, $140, $130 and $130. The Dean is Dr. Irving S. Cutter. Total registration for 1921-1922 was 254; graduates, 17. The next session begins Sept. 15, 1922, and ends May 31, 1923.

NEW HAMPSHIRE

New Hampshire, population 443,083, has one medical college, located at Hanover, population 1,551.

Students desiring to practice medicine in New Hampshire, in addition to a four-year high school education, must complete at least two years of work in an approved college of liberal arts, prior to beginning the study of medicine.

DARTMOUTH MEDICAL SCHOOL.—Organized as New Hampshire Medical Institute in 1797. The first class graduated in 1798. It is under the control of the trustees of Dartmouth College. Clinical teaching was discontinued in 1914. The faculty is made up of 10 professors and 2 instructors, a total of 12. Three years of collegiate work are required for admission. The course covers nine calendar months in each year, or eight months of actual teaching. Candidates for the A.B. or B.S. degree in Dartmouth College may substitute the work of the first year in medicine for that of the senior year in the academic department. The fees for each year are $250. Dean, Dr. John M. Gile; Secretary, Colin C. Stewart. The total registration for 1921-1922 was 28. The next session opens Sept. 21, 1922, and ends June 19, 1923.

NEW YORK

New York State, population 10,384,829, has eight medical colleges. Five of these, College of Physicians and Surgeons (Columbia University), Cornell University Medical College, the University and Bellevue Hospital Medical College, Long Island College Hospital and the New York Homeopathic Medical College and Flower Hospital, are located in New York City, population 5,620,048. Albany Medical College is located in Albany, a city of 113,344 people. The University of Buffalo Medical Department is situated in Buffalo, population 506,775. The College of Medicine, Syracuse University, is in Syracuse, a city of 171,717 inhabitants.

Students who desire to practice in New York must complete two years of college work before entering on the study of medicine.

Albany

ALBANY MEDICAL COLLEGE, 58-64 Eagle Street.—Organized in 1838. The first class graduated in 1839. It became the Medical Department of Union University in 1873. In 1915 Union University assumed educational control. The faculty is composed of 25 professors and 71 instructors, assistants, etc., a total of 96. Two years of collegiate work, including college courses in physics, chemistry (including organic), biology, English, and a modern foreign language, are required for admission. The curriculum covers four years of eight months each. The total fees for the four years, respectively, are $220, $205, $205 and $205. The Dean is Dr. Thomas Ordway. The total registration for 1921-1922 was 88; graduates, 12. The ninety-second session begins Sept. 25, 1922, and ends June 11, 1923.

Buffalo

UNIVERSITY OF BUFFALO MEDICAL DEPARTMENT, High Street, near Main.—Organized in 1846. The first class graduated in 1847. It absorbed the Medical Department of Niagara University in 1898. The faculty is composed of 40 professors and 89 lecturers, assistants, etc., a total of 129. Two years of collegiate work, including college courses in physics, chemistry, biology, English and French or German are required for admission. The course covers four years of eight months each. The total fees for each of the four years are $292, matriculation fee, $5. The Dean is Dr. C. Sumner Jones. Total registration for 1921-1922 was 212; graduates, 22. The seventy-seventh session begins Sept. 25, 1922, and ends June 13, 1923.

New York

COLUMBIA UNIVERSITY COLLEGE OF PHYSICIANS AND SURGEONS, 437 West Fifty-Ninth Street.—Organized in 1807 by the regents of the University of the State of New York as their medical department. The first class graduated in 1811. In 1860 it became, by affiliation, the Medical Department of Columbia College. It was made a permanent part of Columbia College by legislative enactment in 1891. That institution became Columbia University in 1896. The faculty is composed of 99 professors and 204 instructors, demonstrators, etc., a total of 303. Two years of collegiate work of 72 points, including courses in physics, chemistry, biology, English and either French or German, are required for admission. The work covers four years of eight months each. The Dean is Dr. William Darrach. The total fees for the four years, respectively, are $332, $332, $332 and $352. Total registration for 1921-1922 was 356; graduates, 68. The one hundred and fifteenth session begins Sept. 27, 1922, and ends June 6, 1923.

CORNELL UNIVERSITY MEDICAL COLLEGE, First Avenue and Twenty-Eighth Street, New York City, and Ithaca.—Organized in 1898. The first class was graduated in 1899. The work of the first year may be taken either in Ithaca or New York. The faculty is composed of 62 professors and 103 assistants, lecturers, instructors, etc., a total of 165. All candidates for admission must be graduates of approved colleges or scientific schools or seniors of approved colleges which will permit them to substitute the first year of this medical school for the fourth year of their college course and will confer on them the Bachelor degree on the completion of the year's work. The candidate must also have such knowledge of physics, inorganic chemistry and biology as may be obtained in college by a year's course in these subjects when accompanied by laboratory work. The fees for each of the four years are, respectively, $345, $335, $335 and $350. The Dean is Dr. Walter L. Niles. Total registration for 1921-1922 was 213; graduates, 43. The twenty-fifth session begins Sept. 26, 1922, and ends June 7, 1923.

LONG ISLAND COLLEGE HOSPITAL, 350 Henry Street, Brooklyn.—Organized in 1858. The first class graduated in 1860. It has a faculty of 46 professors and 85 assistants, instructors, etc., a total of 131. Two years of collegiate work, including college courses in physics, chemistry and biology, are required for admission. The course covers four years of eight months each. The fees for the four years, respectively, are $356, $350, $350 and $380. The Dean is Prof. Adam M. Miller. Total registration for 1921-1922 was 311; graduates, 47. The sixty-fifth session begins Sept. 25, 1922, and ends May 31, 1923.

NEW YORK HOMEOPATHIC MEDICAL COLLEGE AND FLOWER HOSPITAL, Eastern Boulevard, between Sixty-Third and Sixty-Fourth Streets.—Organized in 1858. Incorporated in 1860 as the Homeopathic Medical College of the State of New York. The title New York Homeopathic Medical College was assumed in 1869. Present title assumed in 1908. The first class graduated in 1861. The course covers four years of eight months each. It has a faculty of 31 professors and 38 lecturers and assistants, a total of 69. The total fees for the four years are, respectively, $300, $300, $300 and $330. The fees for new students entering during 1922-1923 is $250, plus $10 matriculation fee. Total registration for 1921-1922 was 136; graduates, 19. The sixty-third session begins Sept. 18, 1922, and ends May 9, 1923.

UNIVERSITY AND BELLEVUE HOSPITAL MEDICAL COLLEGE, 338 East Twenty-Sixth Street.—Organized in 1898 by the union of the New York University Medical College, organized in 1841, and the Bellevue Hospital Medical College, organized in 1861. It is the Medical Department of New York University. First class graduated in 1899. The faculty is composed of 80 professors and 135 instructors, etc., in all, 215. The course covers four years of eight months each. Entrance requirements are two years of collegiate work, in addition to a standard four-year high school course, including college courses in physics, chemistry and biology. The fees for each of the four years are, respectively, $350, $320, $320 and $345. The Dean is Dr. Samuel A. Brown. Total registration for 1921-1922 was 425; graduates, 79. The next session begins Sept. 13, 1922, and ends June 13, 1923.

Syracuse

SYRACUSE UNIVERSITY COLLEGE OF MEDICINE, 307-311 Orange Street.—Organized in 1872, when the Geneva Medical College, chartered in 1834, was removed to Syracuse, under the title "The College of Physicians and Surgeons of Syracuse University." Present title assumed in 1875, when a compulsory three-year graded course was established. The first class graduated in 1873 and a class graduated each subsequent year. In 1889 the amalgamation with the university was made complete. Course extended to four years in 1896. Two years of a recognized college course are required for admission. The course covers four years of thirty-four weeks each. The fees for each of the four years are, respectively, $324, $324, $324 and $334. The faculty is composed of 32 professors and 83 associate and assistant professors, lecturers and instructors, a total of 115. The Dean is Dr. Herman G. Weiskotten. The total enrolment for 1921-1922 was 165; graduates, 36. The fifty-second session begins Sept. 20, 1922, and ends June 13, 1923.

NORTH CAROLINA

North Carolina, population 2,559,123, has two medical schools, each of which gives only the first two years of the medical course. The School of Medicine of the University of North Carolina is located at Chapel Hill, population 1,483. Wake Forest College School of Medicine is at Wake Forest, population 1,425.

Students intending to practice medicine in North Carolina must complete two years of college work including courses in physics, chemistry and biology in addition to 14 units of high school work before beginning the study of medicine.

Chapel Hill

UNIVERSITY OF NORTH CAROLINA SCHOOL OF MEDICINE.—Organized in 1890. Until 1902 this school gave only the work of the first two years, when the course was extended to four years by the establishment of a department at Raleigh. The first class graduated in 1903. A class was graduated each subsequent year, including 1910, when the clinical department at Raleigh was discontinued. Two years of collegiate work are required for admission. The faculty is composed of 14 professors and 11 lecturers, assistants, etc., a total of 25. The fees for each year are $195. The Dean is Dr. I. H. Manning. The total registration for 1921-1922 was 81. The thirty-seventh session begins Sept. 28, 1922, and ends June 9, 1923.

Wake Forest

WAKE FOREST COLLEGE SCHOOL OF MEDICINE.—This school was organized in 1902. The faculty, including the professors of chemistry, physics and biology, numbers 10 professors and 5 assistants. Only the first two years of the medical course are offered after the completion of freshman and sophomore college work, and on this combined course the B.S. degree is conferred. Each annual course extends over nine months. The fees for each year aggregate $200. The Dean is Dr. Thurman D. Kitchen. The total registration for 1921-1922 was 39. The twenty-first session begins Sept. 5, 1922, and ends May 25, 1923.

NORTH DAKOTA

North Dakota, population 645,680, has one medical college, the School of Medicine of the University of North Dakota, which is situated at University, a suburb of Grand Forks, a city of 14,010 people. It gives only the first two years of the medical course.

Students intending to practice medicine in North Dakota, in addition to a four-year high school education, must complete two years of work in an approved college of liberal arts

including courses in Latin, physics, chemistry, botany and zoology, prior to beginning the study of medicine, and must show evidence of having spent at least one year as an intern in a hospital.

University

UNIVERSITY OF NORTH DAKOTA SCHOOL OF MEDICINE.—Organized in 1905. Offers only the first two years of the medical course. Two years' work in a college of liberal arts is required for admission. The fees are about $50 each year. The faculty consists of 9 professors and 8 instructors, a total of 17. The Dean is Dr. Harley E. French. The total registration for 1921-1922 was 43. The seventeenth session begins Sept. 22, 1922, and ends June 12, 1923.

OHIO

Ohio, population 5,759,394, has four medical colleges. Two of these, the Medical College of the University of Cincinnati and the Eclectic Medical College, are located in Cincinnati, a city of 401,247 inhabitants. Cleveland, population 796,841, contains one medical school, Western Reserve University School of Medicine. Columbus, population 237,031, contains the Ohio State University College of Medicine.

Cincinnati

UNIVERSITY OF CINCINNATI COLLEGE OF MEDICINE, Eden Avenue, Cincinnati General Hospital.—Organized in 1909 by the union of the Medical College of Ohio (founded in 1819) with the Miami Medical College (founded in 1852). The Medical College of Ohio became the Medical Department of the University of Cincinnati in 1896. Under a similar agreement, March 2, 1909, the Miami Medical College also merged into the University, when the title of Ohio-Miami Medical College of the University of Cincinnati was taken. Present title assumed in 1915. Two years of college work are required for admission. The faculty consists of 76 professors, 101 associates, assistants, etc., a total of 177. The course covers four years of eight months each. The fees for each of the four years, respectively, are $320, $320, $270 and $215. The Dean is Dr. Henry Page. The total registration for 1921-1922 was 207; graduates, 47. The next session begins Oct. 2, 1922, and ends June 16, 1923.

ECLECTIC MEDICAL COLLEGE, 630 West Sixth Street.—Organized in 1833 at Worthington as the Worthington Medical College. Removed to Cincinnati in 1843. In 1845 it was chartered as the Eclectic Medical Institute. In 1857 the American Medical College, organized in 1839, was merged into it, and in 1859 the Eclectic College of Medicine and Surgery, organized in 1856, was merged into it. In 1910 it assumed its present title. Classes were graduated in 1833 and in all subsequent years except 1839 to 1843, inclusive. It has a faculty of 30 professors and 16 lecturers and assistants, a total of 46. Two years of college work are required for admission. The course covers four years of eight months each. The total fees for the four years, respectively, are $170, $160, $160 and $160. The Secretary is Dr. John K. Scudder. Total registration for 1921-1922 was 85; graduates, 34. The next session begins Sept. 14, 1922, and ends May 14, 1923.

Cleveland

WESTERN RESERVE UNIVERSITY SCHOOL OF MEDICINE, 1353 East Ninth Street.—Organized in 1843 as the Cleveland Medical College. The first class graduated in 1844. It assumed the present title in 1881. In 1910 the Cleveland College of Physicians and Surgeons was merged. The faculty includes 18 professors and 130 lecturers, assistants, etc., a total of 148. The curriculum embraces three years of eight and one-half months each and one year of eleven months. Three years of college work are required for admission. The total fees for each of the four years are, respectively, $275, $260, $250 and $255. The Dean is Dr. C. A. Hamann. The total registration for 1921-1922 was 154; graduates, 26. The eightieth session begins Sept. 28, 1922, and ends June 14, 1923.

Columbus

OHIO STATE UNIVERSITY COLLEGE OF MEDICINE, 710 North Park Street.—Organized in 1907 as the Starling-Ohio Medical College by the union of Starling Medical College (organized 1847) with the Ohio Medical University (organized 1890). In 1914 it became an integral part of the Ohio State University with its present title. The faculty consists of 42 professors and 54 lecturers, demonstrators, etc., a total of 96. Two years of collegiate work are required for admission. The course covers four years of eight months each. Tuition fees are $150 each year for residents of Ohio; for nonresidents, the fees are $200. The Dean is Dr. Eugene F. McCampbell. The total registration for 1921-1922 was 227; graduates, 35. The next session begins Sept. 28, 1922, and ends June 12, 1923.

OKLAHOMA

Oklahoma, population 2,028,283, has one medical college, the School of Medicine of the University of Oklahoma. The work of the first and second years is given on the academic campus at Norman, a city of about 5,004 inhabitants. The work of the third and fourth years is given in Oklahoma City, which has a population of 91,295 and which is eighteen miles north of Norman.

Students intending to practice medicine in Oklahoma, in addition to a four-year high school education, must complete two years of work in an approved college of liberal arts, including courses in physics, chemistry, biology and a modern language prior to beginning the study of medicine.

Norman and Oklahoma City

UNIVERSITY OF OKLAHOMA SCHOOL OF MEDICINE.—Organized in 1900. Gave only the first two years of the medical course at Norman until 1910, when a clinical department was established at Oklahoma City. It has a faculty of 52 professors and 19 assistant instructors, a total of 71. Two years of collegiate work are required for admission. The course is four years of nine months each. An optional course of six years is offered for the degree of B.S. and M.D. The total fees for the four years are, respectively, $62, $70, $22 and $22. The Dean is Dr. Le Roy Long, 325 East Fourth Street, Oklahoma City. The total registration for 1921-1922 was 117; graduates, 15. The session begins Sept. 14, 1922, and ends June 5, 1923.

OREGON

Oregon, population 783,389, has one medical college, the University of Oregon Medical School, located in Portland, a city of 258,288 population.

Portland

UNIVERSITY OF OREGON MEDICAL SCHOOL, Marquam Hill.—Organized in 1887. The first class graduated in 1888. A class graduated each subsequent year except 1898. Became an integral part of the University of Oregon in 1910. The Willamette University Medical Department was merged in 1913. It has a faculty of 45 professors and 54 lecturers, assistants, etc., a total of 99. Entrance requirements are two years of college work or its equivalent. Beginning with 1924 entrance requirements will be three years of college work. The course is four years of eight months each. The total fees for the four years are, respectively, $165, $160, $160 and $160. The Dean is Dr. Richard B. Dillehunt. The total registration for 1921-1922 was 154; graduates, 10. The thirty-sixth session begins Oct. 2, 1922, and ends June 1, 1923.

PENNSYLVANIA

Pennsylvania, population 8,720,017, has six medical colleges. Of these, Philadelphia, having a population of 1,823,779, contains five, as follows: University of Pennsylvania School of Medicine, Jefferson Medical College, Hahnemann Medical College and Hospital, Woman's Medical College of Pennsylvania and Temple University Department of Medicine. The other school, the School of Medicine of the University of Pittsburgh, is situated in Pittsburgh, a city of 588,343.

Students intending to practice medicine in Pennsylvania, in addition to a four-year high school education, must complete a year's work in an approved college of liberal arts, including college courses in physics, chemistry and biology, before beginning the study of medicine. They must also have completed an internship of at least one year in an approved hospital.

Philadelphia

UNIVERSITY OF PENNSYLVANIA SCHOOL OF MEDICINE, Thirty-Sixth Street and Hamilton Walk.—Organized in 1765. Classes were graduated in 1768 and in all subsequent years except 1772-1779, inclusive. The original title was the Department of Medicine, College of Philadelphia. The present title, School of Medicine of the University of Pennsylvania, was adopted in 1909. It granted the first medical diploma issued in America. In 1916 it took over the Medico-Chirurgical College of Philadelphia to develop it as a graduate school. The faculty consists of 60 professors, associate, adjunct and assistant professors, and 120 lecturers, associates, instructors, etc., a total of 180. The requirements for admission are a standard four-year high school course or its equivalent, plus three years of work in an approved college of arts and science, including courses in French or German, and in physics, chemistry and general biology or zoology, with appropriate laboratory exercises. During the session of 1923-1924, all students will be required to have a college degree or to have completed three years of collegiate training with the provision that the Bachelor's degree will be given in the first year medicine. The first and second year classes are limited to 100 students; third and fourth to 125 each. The course embraces four years of study of thirty-five weeks each. The total fees for each of the four years are, respectively, $348, $320, $320 and $324. The Dean is Dr. William Pepper. Total registration for 1921-1922 was 436; graduates, 118. The one hundred and fifty-seventh session begins Sept. 29, 1922, and ends June 20, 1923.

JEFFERSON MEDICAL COLLEGE, Tenth and Walnut Streets.—Organized in 1825 with its present title as the Medical Department of Jefferson College, Cannonsburg, Pa. Classes have been graduated annually since 1826. In 1838 a separate university charter was granted without change of title, since which time it has continued under the direction of its own board of trustees. It has a faculty of 46 professors, associate and assistant professors, and 127 associates, lecturers, demonstrators and instructors, a total of 173. Entrance requirements are a completed standard four-year high school or college preparatory course, or the equivalent, and in addition two years of work leading to a degree in an approved college of arts and science amounting to at least 60 semester hours, including specified courses in physics, general and

organic chemistry and biology, with laboratory work in each subject. The course of study covers four years of eight and a half months each. The fees are about $325 each year, with a matriculation fee of $5 paid on admission. The Dean is Dr. Ross V. Patterson. The total registration for 1921-1922 was 547; graduates, 88. The ninety-eighth session begins Sept. 25, 1922, and ends June 1, 1923.

WOMAN'S MEDICAL COLLEGE OF PENNSYLVANIA, Twenty-First and N. College Avenue.—Organized in 1850. Classes were graduated in 1852 and in all subsequent years except 1862. It has a faculty of 20 professors and 49 assistants, lecturers, etc., in all 69. Entrance requirements are a completed course in a standard secondary school, and in addition two years of collegiate work, including courses in physics, chemistry, biology and French or German. The curriculum covers four years of eight months each. Fees for each of the four years are, respectively, $225, $204, $227 and $209. The Dean is Dr. Martha Tracy. The total registration for 1921-1922 was 121; graduates, 32. The eighty-third session begins Sept. 27, 1922, and ends June 13, 1923.

HAHNEMANN MEDICAL COLLEGE AND HOSPITAL OF PHILADELPHIA, 220-24 North Broad Street.—Organized in 1848 as the Homeopathic Medical College of Pennsylvania. In 1869 it united with the Hahnemann Medical College of Philadelphia; taking the latter title. Assumed present title in 1885. The first class graduated in 1849. Entrance requirements are a completed course in a standard secondary school and in addition two years devoted to a college course, including English and either French, German or Spanish, physics, chemistry and biology. It has a faculty of 34 professors and 78 lecturers, instructors, etc., in all 112. The work covers four years of eight and a half months each. Total fees are $250 each year. The Dean is Dr. William A. Pearson. The total registration for the college year 1921-1922 was 157; graduates, 17. The seventy-fifth session begins Oct. 2, 1922, and ends June 7, 1923.

THE TEMPLE UNIVERSITY SCHOOL OF MEDICINE, Eighteenth and Buttonwood Streets.—Organized in 1901. The first class graduated in 1904. The faculty numbers 115. Two years of college work are required for admission. The fees for each of the four years, respectively, are $180, $175, $165 and $170. The Dean is Dr. Frank C. Hammond. The total registration for 1921-1922 was 90; graduates, 19. The twenty-second session begins Sept. 25, 1922, and ends June 14, 1923.

Pittsburgh

UNIVERSITY OF PITTSBURGH SCHOOL OF MEDICINE, Bigelow Boulevard.—Organized in 1886, as the Western Pennsylvania Medical College and in 1908 became an integral part of the University of Pittsburgh, removing to the university campus in 1910. The first class graduated in 1887. The faculty is composed of 17 professors and 118 associates, assistants, etc., 135 in all. Entrance requirements are two years of college work, including English, chemistry (inorganic and organic), physics, biology and a reading knowledge of French or German, Italian or Spanish. The course of study is four years of eight and a half months each. The total fees for the four years, respectively, are $325, $310, $310 and $320. The Dean is Dr. Raleigh R. Huggins. The total registration for 1921-1922 was 168; graduates, 26. The thirty-seventh session begins Sept. 25, 1922, and ends June 13, 1923.

SOUTH CAROLINA

South Carolina, population 1,683,724, has one medical college, situated in Charleston, a city of 67,957 people.

Students intending to practice medicine in South Carolina must complete, in addition to 14 units of high school work, two years in an approved college, including courses in English, physics, chemistry and biology.

Charleston

THE MEDICAL COLLEGE OF THE STATE OF SOUTH CAROLINA, 16 Lucas Street.—Organized in 1823 as the Medical College of South Carolina. The first class graduated in 1825. In 1832 a medical college bearing the present title was chartered and the two schools continued as separate institutions until they were merged in 1838. Classes were graduated in all years except 1862 to 1865, inclusive. In 1913, by legislative enactment, it became a state institution. It has a faculty of 34 professors and 27 lecturers, instructors, etc., a total of 61. The course covers four years of eight months each. Two years of collegiate work including courses in physics, chemistry, biology and a modern foreign language are required for admission, in addition to a standard high school preparation. The total fees are $165 annually. The Dean is Dr. Robert Wilson, Jr. Total enrolment for 1921-1922 was 109; graduates, 13. The ninety-fourth session begins Sept. 21, 1922, and ends June 7, 1923.

SOUTH DAKOTA

South Dakota, population 636,547, has one medical college, the University of South Dakota College of Medicine, located at Vermilion, a town of 2,590 people.

Students intending to practice medicine in South Dakota must show that they matriculated in and graduated from medical colleges which required at least two years of collegiate work for admission, including courses in physics, chemistry, biology and a modern language.

Vermilion

UNIVERSITY OF SOUTH DAKOTA COLLEGE OF MEDICINE.—Organized in 1907. Offers only the first two years of the medical course. Two years' work in a college of liberal arts are required for admission. The fees are $60 each year. The faculty numbers 10. The Dean is Christian P. Lommen, B.S. The total registration for 1921-1922 was 43. The sixteenth session begins Sept. 15, 1922, and ends June 16, 1923.

TENNESSEE

Tennessee, population 2,337,885, has four medical colleges. Of these, Vanderbilt University School of Medicine and Meharry Medical College are situated in Nashville, a city with a population of 118,342. The College of Medicine of the University of Tennessee and the University of West Tennessee College of Medicine and Surgery are located in Memphis, population 162,351.

Students intending to practice medicine in Tennessee must complete two years of collegiate work, including courses in physics, chemistry, biology and a modern language, in addition to a four-year high school course, before entering on the study of medicine.

Memphis

UNIVERSITY OF TENNESSEE COLLEGE OF MEDICINE, three buildings, 879 Madison Avenue.—Organized in 1876 at Nashville as Nashville Medical College. First class graduated 1877, and a class graduated each subsequent year. Became Medical Department of University of Tennessee in 1879. In 1909 it united with the Medical Department of the University of Nashville to form the joint Medical Department of the Universities of Nashville and Tennessee. This union was dissolved in 1911. The trustees of the University of Nashville by formal action of that board named the University of Tennessee College of Medicine as its legal successor. In 1911 it moved to Memphis, where it united with the College of Physicians and Surgeons. The Memphis Hospital Medical College was merged in 1913. Lincoln Memorial University Medical Department was merged in 1914. The faculty includes 51 professors and 71 assistants, instructors, etc., a total of 122. Entrance requirements are a high school education plus two years of collegiate work. Students taking the two-year premedical course in Knoxville may secure the B.S. and M.D. degrees. The total fees for the four years, respectively, are $117, $112, $107 and $132 for bona fide residents of the state, and $50 more each year for nonresidents. The Acting Dean is Dr. James B. McElroy. Total registration for 1921-1922 was 108; graduates, 11. The next session begins Sept. 30, 1922, and ends June 11, 1923.

UNIVERSITY OF WEST TENNESSEE MEDICAL DEPARTMENT, Colored. 1190 South Phillips Place.—Organized in 1900. The first class graduated in 1904, and a class graduated each subsequent year. Total registration for 1921-1922 was 7; graduates, 4. *Official reports indicate that the diplomas of this college are not recognized by the licensing boards of Tennessee and forty-six other states.*

Nashville

VANDERBILT UNIVERSITY SCHOOL OF MEDICINE.—This school was founded in 1874. The first class graduated in 1875. The faculty consists of 40 professors and 50 lecturers, a total of 90. Two years of collegiate work is required for admission. The course covers four years of nearly eight and a half months each. The total fees for the four years, respectively, are $150, $150, $150 and $175. The Acting Dean is Dr. Lucius E. Burch. The total registration for 1921-1922 was 149; graduates, 13. The forty-ninth session begins Sept. 27, 1922, and ends June 13, 1923.

MEHARRY MEDICAL COLLEGE. Colored. 1118 First Avenue, South.—This school was organized in 1876 as the Medical Department of Central Tennessee College, which became Walden University in 1900. First class graduated in 1877. Obtained new charter independent of Walden University in 1916. The faculty is made up of 23 professors and 15 instructors, demonstrators, lecturers, etc, 38 in all. The work embraces four years of thirty-one weeks each. The total fees for each of the first three years are $152 and for the fourth year $172. The President is Dr. John J. Mullowney. Total registration for 1921-1922 was 180; graduates, 28. The forty-seventh session begins Oct. 2, 1922, and ends May 24, 1923.

TEXAS

Texas, population 4,663,228, has two medical colleges. The University of Texas School of Medicine is located at Galveston, a city of 44,255 inhabitants. The Baylor University College of Medicine is located in Dallas, population 158,976.

Students intending to practice medicine in Texas must complete at least a year of collegiate work, including courses in physics, chemistry, biology and modern language, in addition to a standard four-year high school course, before entering on the study of medicine.

Dallas

BAYLOR UNIVERSITY COLLEGE OF MEDICINE, 720 College Avenue.—Organized in 1900 as the University of Dallas Medical Department. In 1903 it took its present name and became the Medical Department of Baylor University. It acquired the charter of Dallas Medical College in 1904. The first class graduated in 1901. The faculty consists of 44 professors and 39 instructors and assistants, a total of 83. Entrance requirements are two years of college work in addition to a four-year high school education. The course is four years of eight months each. The fees for each of the four years, respectively, are $195, $190, $190 and $185. The Dean is Dr. McIver Woody. Total registration for

1921-1922 was 112; graduates, 23. The twenty-third session begins Oct. 2, 1922, and ends June 10, 1923.

Galveston

UNIVERSITY OF TEXAS SCHOOL OF MEDICINE, Avenue B, between Ninth and Tenth Streets.—Organized in 1891. The first class graduated in 1892. It has a faculty of 11 professors and 32 lecturers and instructors, a total of 43. The curriculum embraces four years of eight months each. The entrance requirement is two years of collegiate work in addition to a four year high school education. The total fees for the four years, respectively, are $88, $58, $35 and $23 for residents of the state; $150 each year additional for nonresidents. The Acting Dean is Dr. W. Keiller. Total registration for 1921-1922 was 256; graduates, 42. The thirty-second session begins Sept. 30, 1922, and ends May 31, 1923.

UTAH

Utah, population 449,396, has one medical college, the School of Medicine of the University of Utah, situated at Salt Lake City, which has 118,110 people.

Students intending to practice medicine in Utah, in addition to a four-year high school education, must complete at least one year of collegiate work, including courses in physics, chemistry and biology, prior to beginning the study of medicine.

Salt Lake City

UNIVERSITY OF UTAH SCHOOL OF MEDICINE.—Organized in 1906. Gives only first two years of medical course. Each course covers thirty-six weeks. Two years of collegiate work are required for admission. Beginning in 1924 three years of college work will be required for admission. The medical faculty consists of 11 professors and 15 lecturers and assistants, a total of 26. The fees are $130 each year. The Dean is Dr. Perry G. Snow. Total registration for 1921-1922 was 58. The sixteenth session begins Sept. 25, 1922, and ends June 7, 1923.

VERMONT

Vermont, population 352,428, has one medical school, located at Burlington, a town of 22,779 people.

Students who desire to practice medicine in Vermont, in addition to a standard four-year high school education, must complete two years of collegiate work, including college courses in physics, chemistry and biology, before entering on the study of medicine.

Burlington

UNIVERSITY OF VERMONT COLLEGE OF MEDICINE, Pearl Street, College Park.—Organized with complete course in 1822. Classes graduated in 1823 to 1836, inclusive, when the school was suspended. It was reorganized in 1853 and classes were graduated in 1854 and in all subsequent years. The faculty numbers 43. Two years of college work in addition to a four-year high school education are required for admission. The course of study covers four years of nine months each. The total fees for each of the first three years are $200 and $225 for the fourth year. The Dean is Dr. H. C. Tinkham. The total registration for 1921-1922 was 117; graduates, 16. The next session begins Sept. 20, 1922, and ends June 18, 1923.

VIRGINIA

Virginia, population 2,309,187, has two medical colleges, one, the Department of Medicine of the University of Virginia, situated in Charlottesville, population 10,688, and the Medical College of Virginia at Richmond, population 171,667.

Students desiring to practice in Virginia must be graduates of medical colleges which require that all students admitted shall have completed two years of collegiate work, including courses in physics, chemistry, biology and a modern language, preferably German, in addition to a four-year high school education.

Charlottesville

UNIVERSITY OF VIRGINIA DEPARTMENT OF MEDICINE.—Organized in 1827. Classes were graduated in 1828 and in all subsequent years except 1865. It has a faculty of 19 professors and 25 lecturers, instructors, assistants, etc., a total of 44. The requirements for admission are the completion of a four-year high school course, or its equivalent, and two years of college work devoted to English, mathematics, chemistry, physics and biology, and a foreign language. Total fees for the four years, respectively, are $235, $240, $180 and $175. The Dean is Dr. Theodore Hough. The total registration for 1921-1922 was 152; graduates, 20. The ninety-fourth session begins Sept. 14, 1922, and ends June 12, 1923.

Richmond

MEDICAL COLLEGE OF VIRGINIA, Marshall and College Streets.—Organized in 1838 as the Medical Department of Hampden Sydney College. Present title was taken in 1854. In 1913 the University College of Medicine was merged. In 1914 the North Carolina Medical College was merged. Classes were graduated in 1840 and in all subsequent years. It has a faculty of 44 professors and 60 lecturers, instructors, etc., a total of 104. The requirement for admission is a four-year high school education and in addition two years of collegiate work, including courses in physics, chemistry, biology and French or German. The course embraces four years of eight months each. Total fees for the four years, respectively, are $230, $230, $220 and $250. The Dean is Dr. E. C. L. Miller. The total registration for 1921-1922 was 163; graduates, 27. The eighty-fourth session begins Sept. 13, 1922, and ends June 5, 1923.

WEST VIRGINIA

West Virginia, population 1,463,701, has one medical college, the School of Medicine of West Virginia University, which offers the first two years of the medical course. It is located at Morgantown, a city of 12,127 population.

Students who desire to practice medicine in West Virginia must complete, in addition to a high school education, two years of collegiate work, including courses in physics, chemistry and biology, before entering on the study of medicine.

Morgantown

WEST VIRGINIA UNIVERSITY SCHOOL OF MEDICINE.—Organized in 1902, and gives only the first two years of the medical course. Two years of college work are required for admission and the Bachelor's degree will be granted to those who finish the two years in medicine. Session extends through nine months. The faculty numbers 15. Fees: For residents of the state, $90 each year; for nonresidents, $240. Cadets pay laboratory fees only. The Dean is Dr. John N. Simpson. The total registration for 1921-1922 was 104. The next session begins Sept. 18, 1922, and ends June 4, 1923.

WISCONSIN

Wisconsin, population 2,632,067, has two medical colleges, the Medical School of the University of Wisconsin, which teaches the first two years of the medical course, and is located at Madison, a city of 38,378 people, and the Marquette University School of Medicine, located at Milwaukee, a city of 457,147 people.

Students intending to practice medicine in Wisconsin, prior to entering a medical school, must complete, besides a four-year high school course, two years of collegiate work, including courses in physics, chemistry, biology and a modern language.

Madison

UNIVERSITY OF WISCONSIN MEDICAL SCHOOL.—Organized in 1907. Gives only the first two years of the medical course. For matriculation at least two years in a college of arts and science or an equivalent training are required, including two years of Latin, a reading knowledge of French or German, and at least a year's work in physics, chemistry and biology. It has a faculty of 17 professors and 42 lecturers, instructors, etc., a total of 59. Tuition fees: for residents of the state, $90 for first year and $85 for second year; for nonresidents, $152 for first year and $147 for second year. The Dean is Dr. Charles R. Bardeen. The registration for 1921-1922 was 160. The fifteenth session begins Sept. 20, 1922, and ends June 12, 1923.

Milwaukee

MARQUETTE UNIVERSITY SCHOOL OF MEDICINE, Fourth Street and Reservoir Avenue.—Organized in December, 1912, by the merger of the Milwaukee Medical College and the Wisconsin College of Physicians and Surgeons. It has a faculty of 98. The entrance requirements are two years of college work, including courses in physics, chemistry, biology and a modern language. The curriculum covers four years of eight and a half months each. The fees for the four years, respectively, are $305, $295, $295 and $275. The Dean is Dr. Louis F. Jermain; the Dean of students is Dr. Eben J. Carey. The registration for 1921-1922 was 187; graduates, 19. The eleventh session begins Oct. 2, 1922, and ends June 14, 1923.

PHILIPPINE ISLANDS

The Philippine Archipelago, with a population of 10,607,872, has two medical colleges, the University of the Philippines College of Medicine and Surgery and the University of St. Thomas College of Medicine and Surgery. They are located in the city of Manila, which in 1914 had a population of 283,613.

Manila

UNIVERSITY OF THE PHILIPPINES COLLEGE OF MEDICINE AND SURGERY, Manila.—Organized in 1907 as the Philippine Medical School, under the support of the government of the Philippine Islands. Present title in 1910. The faculty includes 35 professors and 36 lecturers, assistants, etc., a total of 71. A two-year collegiate course leading to the degree of bachelor of arts is required for admission, including courses in English, physics, chemistry, biology and either French or German. The course extends over five years. In the fifth year the students are assigned as clinical clerks in the Philippine General Hospital. The Dean is Dr. Fernando Calderon. The total registration for 1921-1922 was 127; graduates, 25. The sixteenth session began July 1, 1922, and ends April 4, 1923.

UNIVERSITY OF ST. THOMAS COLLEGE OF MEDICINE AND SURGERY, Manila.—Organized in 1907. The faculty includes 16 professors and

8 assistants, instructors, etc., a total of 24. The course extends over five years. The Dean is Jose L. de Castro. The total registration for 1921-1922 was 403; graduates, 45. The next session begins July 2, 1922, and ends March 31, 1923.

CANADA

The Dominion of Canada has nine medical colleges, six of which require a six-year course, including courses in physics, chemistry and biology. This course is practically equal to that in the colleges of the United States which require two years of college work for admission, including the science courses named.

Alberta

UNIVERSITY OF ALBERTA, FACULTY OF MEDICINE, Edmonton.—Organized in 1913. Offers the first four years of the six-year medical course. Faculty numbers 52. Fees for the first year are $90; for the second, third and fourth years, each $115. The Registrar is Cecil E. Race, B.A. The registration for 1921-1922 was 155. The tenth session begins Sept. 26, 1922, and ends May 11, 1923.

Manitoba

UNIVERSITY OF MANITOBA FACULTY OF MEDICINE, WINNIPEG.—Organized in 1883 as Manitoba Medical College; first class graduated in 1886, and a class graduated each subsequent year. The college transferred all its property to the University of Manitoba in 1919 and assumed the present title. The faculty numbers 113. The total fees for the five years, respectively, are $178, $173, $183, $183 and $173. Matriculation requirements include two years of college work in the Faculty of Arts and Science of a recognized university subsequent to the complete high school course required for entrance to the latter. The Dean is Dr. S. Willis Prowse. Total registration for 1921-1922 was 305; graduates, 29. The next session begins Sept. 5, 1922, and ends May 31, 1923.

Nova Scotia

DALHOUSIE UNIVERSITY, FACULTY OF MEDICINE, Halifax, N. S.—Organized in 1867. Incorporated as the Halifax Medical College in 1875. Reorganized as an examining faculty, separate from the Halifax Medical College, in 1855. In 1911, in accordance with an agreement between the Governors of Dalhousie University and the Corporation of the Halifax Medical College, the work of the latter institution was discontinued and a full teaching faculty was established by the University. By an arrangement between Dalhousie University and the Provincial Medical Board of Nova Scotia, the final professional examinations are conducted conjointly by the university and the board, and candidates may qualify at the same time for their academic degrees and the provincial license. First class graduated in 1872. It has a faculty of 49 professors, lecturers and demonstrators. Requires matriculation, examination and a graded course of six years, including premedical courses in physics, chemistry and biology. The fees are $200 each year. The total registration for 1921-1922 was 140; graduates, 24. The Dean is Dr. John Stewart. The next session begins Oct. 2, 1922, and ends May 26, 1923.

Ontario

UNIVERSITY OF TORONTO, FACULTY OF MEDICINE, Toronto.—Organized in 1843 as the Medical Faculty of King's College. Abolished in 1853. Reestablished in 1887. In 1902 it absorbed Victoria University, Medical Department, and in 1903 absorbed Trinity Medical College. The course of study covers six years of eight months each, the first two being devoted largely to physics, chemistry, biology and cultural courses in history, science and English. It has a faculty of 58 professors and 194 lecturers, associates, etc., a total of 252. The fees are $163 for the first four years and $191 for the fifth year. The Dean is Dr. A. Primrose. The total registration for 1921-1922 was 1,056; graduates, 138. The next session begins Sept. 26, 1922, and ends May 31, 1923.

QUEEN'S UNIVERSITY FACULTY OF MEDICINE, Kingston.—Organized 1854, first class graduated in 1855, and a class graduated each subsequent year. The faculty was originally a department of the university, but a separation took place in 1866, when the school was conducted under the charter of the Royal College of Physicians and Surgeons at Kingston. In 1892 the school again became an integral part of Queen's University. The faculty includes 26 professors and 24 assistants, instructors, etc., a total of 50. The fees for the six years are, respectively, $130, $135, $135, $144, $144 and $134; fee for M.D., C.M. degrees, $30. The course covers six years of thirty teaching weeks each, the first year including courses in physics, chemistry, biology, English and French or German. The total registration in 1921-1922 was 240; graduates, 40. The Dean is Dr. J. C. Connell. The next session begins Sept. 28, 1922, and ends May 26, 1923.

WESTERN UNIVERSITY, FACULTY OF MEDICINE, London.—Organized in 1881, first class graduated in 1883, and a class graduated each subsequent year. The medical school has been under the control of the Board of Governors of the Western University since 1913. The faculty numbers 55. The course is six years, of eight months each, the first year including premedical courses in physics, chemistry and biology. Beginning with the session of 1923-1924 two years of premedical college work will be required followed by a four year medical course. The total fees for the six years, respectively, are $155, $150, $150, $158, $158 and $183. The Acting Dean is Dr. Paul S. McKibben. Total registration for 1921-1922 was 121; graduates, 18. The next session begins Oct. 2, 1922, and ends May 25, 1923.

Montreal

MCGILL UNIVERSITY, FACULTY OF MEDICINE.—Founded 1824 as Montreal Medical Institution; became the Medical Faculty of McGill University in 1829; first class graduated under the university auspices in 1833. No session between 1836-1839 owing to political troubles. In 1905 it absorbed the Faculty of Medicine of the University of Bishop College. The course extends over six years of eight months each, including the two preliminary years. The faculty numbers 150. The total fees each year are $200. The total registration for 1921-1922 was 705; graduates, 108. The Assistant Dean is Dr. John W. Scane. The next session begins Oct. 2, 1922, and ends June 10, 1923.

UNIVERSITY OF MONTREAL MEDICAL FACULTY, Montreal.—Organized in 1843, incorporated in 1845 as the Montreal School of Medicine and Surgery. In 1891, by act of parliament, the Medical Faculty of Laval University (organized in 1878) was absorbed. Present name, by act of Parliament, in 1920. A class was graduated in 1843 and in each subsequent year. The faculty numbers 80. The course extends over six years, including premedical courses in physics, chemistry and biology. The total fees each year are $175. The Dean is Louis de Harwood. The total registration for 1921-1922 was 321; graduates, 55. The next session begins Sept. 15, 1922, and ends June 15, 1923.

Quebec

LAVAL UNIVERSITY FACULTY OF MEDICINE, Quebec.—The Quebec School of Medicine, organized in 1848, became in 1852 the Medical Department of Laval University; first class graduated in 1855, and a class graduated each subsequent year. The faculty numbers 35. The fees are $135 each year. The course extends over five years, the first year including courses in physics, chemistry and biology. The Secretary is Dr. Arthur Vallée, Quebec. Total registration for 1921-1922 was 163; graduates, 22.

State Requirements of Preliminary Education

There are now forty-two states (counting Alaska Ter.) which have adopted requirements of preliminary education in addition to a standard four-year high school education. These states, the number of college years required and the time the higher requirements became or become effective, are as follows:

State Examining Board of	One Year of College Work		Two Years of College Work	
	Affects Students Matriculating	Affects All Graduates	Affects Students Matriculating	Affects All Graduates
Alabama	.....	....	1915-16	1919
Alaska	1914-15	1918	1918-19	1922
Arizona	1914-15	1918	1918-19	1922
Arkansas	1915-16	1919	1918-19	1922
California	1915-16	1919	.....	....
Colorado	1908-09	1912	1910-11	1914
Connecticut	1911-12	1915	.....	....
Delaware*	.....	....	.....	....
District of Columbia†	.....	....	.....	....
Florida	1914-15	1918	1918-19	1922
Georgia	.....	....	1918-19	1922
Idaho	.....	....	1915-16	1919
Illinois	1915-16	1919	1918-19	1922
Indiana	1910-11	1914	1911-12	1915
Iowa	.....	....	1911-12	1915
Kansas	1910-11	1914	1918-19	1922
Kentucky	1914-15	1918	1918-19	1922
Louisiana	1915-16	1919	1918-19	1922
Maine	1915-16	1919	1916-17	1920
Maryland	1914-15	1918	1918-19	1922
Massachusetts†	.....	....	.....	....
Michigan	1914-15	1918	1918-19	1922
Minnesota	.....	....	1908-09	1912
Mississippi	1915-16	1919	1919-20	1923
Missouri*	.....	....	.....	....
Montana	1914-15	1918	1918-19	1922
Nebraska*	.....	....	.....	....
Nevada*	.....	....	.....	....
New Hampshire	1914-15	1918	1915-16	1919
New Jersey	1915-16	1919	1917-18	1921
New Mexico	1914-15	1918	1918-19	1922
New York	1917-18	1921	1918-19	1922
North Carolina	1914-15	1918	1918-19	1922
North Dakota	.....	....	1908-09	1912
Ohio*	.....	....	.....	....
Oklahoma	1914-15	1918	1917-18	1921
Oregon	.....	....	1920-21	1924
Pennsylvania	1914-15	1918	.....	....
Rhode Island	1914-15	1918	1918-19	1922
South Carolina	.....	....	1918-19	1922
South Dakota	1908-09	1912	1911-12	1915
Tennessee	1916-17	1920	1918-19	1922
Texas	1914-15	1918	.....	....
Utah	1913-14	1917	1922-23	1926
Vermont	1913-14	1917	1918-19	1922
Virginia	1914-15	1918	1917-18	1921
Washington	1914-15	1918	1918-19	1922
West Virginia	1917-18	1921	1920-21	1924
Wisconsin	.....	....	1915-16	1919
Wyoming†	.....	....	.....	....

* Require a four-year high school education or its equivalent.
† No fixed standard.

THE ASSOCIATION OF AMERICAN MEDICAL COLLEGES

The requirements for admission to and graduation from colleges holding membership in this association are 15 units of high school work and two years (60 semester hours) of college work.

CURRICULUM: The entire course of four years shall consist of not less than 3,600 hours, and shall be grouped in divisions and subdivided into subjects, each division and each subject to be allotted approximately the number of hours and percentages of the whole shown in the following schedule:

DIVISION I.

ANATOMY, 684 HOURS (19%).	Minimum % of 3,600 Hours.
1. Gross anatomy, including clinical or applied anatomy	19%
2. Microscopic anatomy	
3. Embryology	

DIVISION II.

PHYSIOLOGY AND CHEMISTRY, 468 HOURS (13%).

1. Physiology	8%
2. Biochemistry	5%

DIVISION III.

PATHOLOGY AND BACTERIOLOGY, 468 HOURS (13%).

1. Pathology, including necropsies	8 %
2. Bacteriology, including serology and immunology	3½%
3. Preventive medicine and public health	1½%

DIVISION IV.

PHARMACOLOGY, 216 HOURS (6%).

1. Materia medica and pharmacy	6%
2. Pharmacology	

DIVISION V.

MEDICINE AND MEDICAL SPECIALTIES, 900 HOURS (25%).

1. General medicine, including laboratory diagnosis	15 %
2. Pediatrics	4 %
3. Nervous and mental diseases	3½%
4. Dermatology and syphilis	2 %
5. Medical jurisprudence	½%

DIVISION VI.

SURGERY AND SURGICAL SPECIALTIES, 648 HOURS (18%).

1. Surgery	11 %
2. Orthopedic surgery	2 %
3. Urology	1 %
4. Ophthalmology	1½%
5. Otology, rhinology and laryngology	1½%
6. Roentgenology	1 %

DIVISION VII.

OBSTETRICS AND GYNECOLOGY, 216 HOURS (6%).

1. Obstetrics, including obstetric surgery	4 %
2. Gynecology	2 %

When teaching conditions demand it, a subject may be transferred from one division to another.

MEMBERS OF ASSOCIATION

University of Alabama School of Medicine.
Stanford University School of Medicine.
University of California Medical School.
University of Colorado School of Medicine.
Yale University School of Medicine.
Georgetown University Medical School.
George Washington University School of Medicine.
Howard University School of Medicine.
Army Medical School.
Navy Medical School.
Emory University Medical Department.
University of Georgia College of Medicine.
Loyola University School of Medicine.
Northwestern University Medical School.
Rush Medical College.
University of Illinois College of Medicine.
Indiana University School of Medicine.
State University of Iowa College of Medicine.
University of Kansas School of Medicine.
University of Louisville Medical Department.
Tulane University of Louisiana School of Medicine.
Johns Hopkins University Medical Department.
University of Maryland School of Medicine and College of Physicians and Surgeons.
Boston University School of Medicine.
Medical School of Harvard University.
Tufts College Medical School.
Detroit College of Medicine and Surgery.
University of Michigan Medical School.
University of Minnesota Medical School.
University of Mississippi School of Medicine.
St. Louis University School of Medicine.
University of Missouri School of Medicine.
Washington University Medical School.
John A. Creighton Medical College.
University of Nebraska College of Medicine.
Columbia University College of Physicians and Surgeons.
Cornell University Medical College.
Long Island College Hospital.
Syracuse University College of Medicine.
University and Bellevue Hospital Medical College.
University of Buffalo Department of Medicine.
University of North Carolina School of Medicine.
Wake Forest College School of Medicine.
University of North Dakota School of Medicine.
Ohio State University College of Medicine.
University of Cincinnati College of Medicine.
Western Reserve University School of Medicine.
University of Oklahoma School of Medicine.
Hahnemann Medical College and Hospital.
Jefferson Medical College.
University of Pennsylvania School of Medicine.
University of Pittsburgh School of Medicine.
Woman's Medical College of Pennsylvania.
University of the Philippines College of Medicine and Surgery.
Medical College of the State of South Carolina.
University of South Dakota College of Medicine.
Meharry Medical College (Affiliated Member).
University of Tennessee College of Medicine.
Vanderbilt University Medical Department.
Baylor University College of Medicine.
University of Texas Medical Department.
University of Vermont College of Medicine.
Medical College of Virginia.
West Virginia University School of Medicine.
University of Virginia Department of Medicine.
Marquette University School of Medicine.
University of Wisconsin Medical School.

The secretary-treasurer of the Association is Dr. Fred C. Zapffe, 3431 Lexington Street, Chicago.

Hospital Intern Year

Eleven medical colleges have adopted the requirement of a fifth year to be spent by the student as an intern in an approved hospital or in other acceptable clinical work before the M.D. degree will be granted. These colleges and the years when the requirement became effective for matriculants and graduates are as follows:

	Affects Matriculants	Affects Graduates
University of Minnesota Medical School	1910-11	1915
Stanford University School of Medicine	1914-15	1919
Rush Medical College (University of Chicago)	1914-15	1919
University of California Medical School	1914-15	1919
Marquette University School of Medicine	1915-16	1920
Northwestern University Medical School	1915-16	1920
University of Illinois College of Medicine	1917-18	1922
Loyola University School of Medicine	1917-18	1922
Columbia Univ. Coll. of Phys. & Surgs., N. Y.	1918-19	1923
Detroit College of Medicine and Surgery	1919-20	1924
University of Nebraska College of Medicine	1922-23	1927

The hospital intern year has been adopted as an essential qualification for the license to practice in ten states, becoming effective in different years, as follows:

State Board of	Affects Student Matriculants	Affects All Applicants
Pennsylvania	1909-10	1914
New Jersey	1911-12	1916
Alaska	1912-13	1917
Rhode Island	1913-14	1917
North Dakota	1913-14	1918
Washington	1914-15	1919
Illinois	1917-18	1922
Michigan	1917-18	1922
Iowa	1918-19	1923
Texas	1919-20	1924

Metric System in England.—The advantages of the metric system have frequently been put forward, and though in many branches of science the system has secured a firm foothold, yet medicine, so far as clinical work is concerned, lags behind, apparently reluctant to make the experiment. . . . The present tendency is so clearly toward the approximation of scientific methods amongst all civilized nations that there need be no doubt that in the future the metric system will be adopted in this country.—*Lancet*, March 11, 1922.

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SATURDAY, AUGUST 19, 1922

MEDICAL EDUCATION—PROGRESS OF TWENTY-TWO YEARS

This week, for the twenty-second consecutive year, The Journal publishes statistics regarding medical education in the United States. During these years, medical education in this country has undergone extensive improvement, and educational standards have been brought to a reasonably high plane.

BEGINNING OF THE CAMPAIGN

In 1901, when The Journal first published its statistics regarding medical colleges, students and graduates, many of the 159 medical colleges listed in the first Educational Number were known to be joint stock corporations conducted largely for the profit of their owners. Little or no attention was then paid to entrance requirements, even by some of the larger colleges. In regard to the number and qualifications of teachers, the number and equipment of laboratories, the amount and use made of clinical material, or the methods of teaching employed, no definite information was available. No one, in fact, knew just how serious conditions in the medical schools actually were. Sectarian medicine was at its zenith, with twenty-two homeopathic and ten eclectic colleges. The enrolments in all medical schools had reached the enormous total of 26,417 students, and of these 5,444 graduated.

The campaign was begun, therefore, with the first publication of data in 1901. The information published showed the need of improvement, and this led to the creation in 1904 of a permanent committee of the American Medical Association—the Council on Medical Education—to centralize efforts in this particular work.

PROGRESS FROM 1906 TO 1910

As a part of its function, the Council on Medical Education naturally took over the work of collecting and tabulating statistics relating to medical education. A permanent secretary was employed; files were established for the information, and a careful and extensive study of medical education was begun. A study of medical education abroad showed that there were 154 medical schools in all the rest of the world,[1] while the United States alone had 160—a large oversupply. Except in a few medical schools, also, educational standards in this country were much lower than those abroad.[2] The Council immediately prepared two educational standards,[3] therefore, one for immediate adoption by the medical schools, and another, termed "the ideal standard," for later adoption. Mergers of medical schools were urged in cities or states where two or more existed by which, in each instance, one stronger and better institution resulted. An annual conference held each year since 1904 resulted in securing uniformity of action by all organizations interested in medical education. At these conferences the discussion of educational problems resulted in improved entrance standards and methods of teaching.

In 1906 the Council made its first tour of inspection of all medical schools, and in 1907 the first classification was prepared. This was read at the annual conference and at the meeting of the House of Delegates, and each college was notified of its position in the classification. The second tour of inspection was completed in 1910, and the second classification of medical schools was published.[4] Before the second inspection was made, the number of medical colleges had been reduced, largely by mergers, from 162 to 131; the number of graduates was reduced from 5,747 to 5,440, and the number of students from 28,142 to 21,526. By this time, also, many of the medical schools had undergone extensive internal development. Entrance standards had been raised; better teachers employed; better buildings erected; new laboratories established, and extensive clinical facilities secured. Where formerly only four medical schools were requiring any college work for admission, by 1910 thirty-five colleges and eight state licensing boards had adopted a requirement of one or two years of college work as a minimum standard of preliminary education. Through the inspections and other means of obtaining first hand information, the data published each year in the Educational Number were verified and made reliable.

Following the first inspection of the medical schools, at the urging of the Council, the Carnegie Foundation for the Advancement of Teaching consented to make a survey of the medical schools. As a consequence, the second tour of inspection was made jointly by representatives of the Council and the Foundation. In its report, the Carnegie Foundation made no classification and suggested no standards, but it did secure a wide publicity to its report, which was of great service in the later development of medical education.

PROGRESS FROM 1910 TO 1915

The information collected by the Council regarding all medical colleges, existing and extinct, during the

1. List in J. A. M. A. **49**: 596 (Aug. 17) 1907.
2. See chart in J. A. M. A. **55**: 680 (Aug. 10) 1910.
3. J. A. M. A. **45**: 270 (July 22) 1905.
4. J. A. M. A. **54**: 2061 (June 1) 1910.

first four year period (1905-1909) was sufficiently complete to permit the publication of a reliable chart,[5] which showed the number of medical colleges existing in the United States in every year since 1765, when the Department of Medicine of the College of Philadelphia —now the University of Pennsylvania—was organized. In 1910, also, a medical students' register was established through which a better record of the histories and educational qualifications of medical students has been secured, as well as the facts regarding their promotion from class to class. In the establishing of this register, the Council had a hearty and gratifying cooperation from the majority of medical schools. During the second five year period (1910-1915) two other complete inspections of medical colleges were made and new classifications were published.

During this period also twenty medical colleges were merged with others and sixteen became extinct, which further reduced the total number from 131 to ninety-five. The number of medical students was reduced from 21,526 to 14,891, and the number of graduates from 5,440 to 3,536. The number of medical colleges requiring one or two years of college work for admission was further increased from thirty-five (27 per cent.) to eighty-three (88 per cent.), and the number of licensing boards holding to these higher requirements was increased from eight to eighteen. Not only had the majority of medical colleges adopted the higher entrance requirements, but also, through the reliable data collected by the Council, the methods employed by each college in admitting students, and the strictness with which the entrance requirements were administered, were known with fair accuracy. The Council, therefore, was in position to recognize at once any faulty methods or "paper standards," which were not uncommon before the campaign for improvement began. The continuous agitation for better conditions, aided materially by the report of the Carnegie Foundation, appealed to philanthropists to such an extent that endowments for medical education were greatly increased, and large gifts for medical buildings, new laboratories, scholarships, endowed chairs and teaching hospitals became of frequent occurrence.

The fall of 1914 marked an epoch in the progress of medical education in the United States in that a year of college work, including courses in physics, chemistry and biology as a requirement for admission to medical schools, was made an essential for the Council's Class A rating. Thus, the standard which in 1905 had been termed "ideal" became the essential standard in 1914.

PROGRESS OF THE LAST SIX YEARS

In 1916, the entrance requirements of medical schools were further extended from one to two years of college work in addition to a high school education; by order of the House of Delegates, the latter standard was made an essential for the Class A rating, beginning Jan. 1, 1918. This was not a drastic ruling, since forty-six medical colleges and seventeen state licensing boards already had put that standard into effect.

By 1917, when the United States entered the World War, the total number of medical schools had been reduced to ninety-five, but the number of higher grade schools had been increased from four to eighty-six. For several years, also, the majority of graduates had received a much better training as a result of the greatly improved conditions in medical schools. It was these recent graduates, meanwhile, who in large proportions entered the government medical services and who became responsible for the medical welfare of America's soldiers and sailors. The campaign for improvement, which had made such rapid headway since 1904, was, therefore, of great benefit to the nation during the war.

Through the medical students' register, which contained the home addresses of the majority of medical students, information was secured which led to the retaining of students in the medical schools as members of the Medical Enlisted Reserve Corps, instead of having them drafted into the army, which would have resulted in the closing of many of the medical schools.

SUMMARY OF PROGRESS MADE

Medical education has been greatly improved, and educational standards have been placed on a par with those of other leading nations. In place of a large oversupply of medical schools, there are now eighty-one—a more normal supply—seventy-four of which are requiring for admission two or more years of college work. Besides the advance in the requirements for admission, many other improvements have been made. Endowments have been increased; new and larger medical buildings have been erected or entire teaching plants constructed; more and better equipped laboratories have been established; better hospital relations have been secured—several colleges having built hospitals of their own—and better teaching methods have been adopted. The number of students since 1904 was reduced from 28,142 to 16,140;[6] at the same time, the proportion of medical students in well equipped medical colleges has been increased from 3.9 per cent. to 96.1 per cent. Of medical graduates, likewise, although the total has been reduced by 40 per cent., the number coming from high grade, well equipped medical colleges has been increased from 5.6 per cent. to 94.4 per cent. The number of graduates this year—2,529—is the smallest number reported since the publishing of these statistics began. It is the war class and is made up of those matriculating in 1918, who were not subject to the draft or who did not enlist. Indications are that next year there will be approximately 3,500 graduates.

5. J. A. M. A. **61**: 578 (Aug. 23) 1913.

6. The lowest number was 13,052 in 1919; enrolments are again on the increase.

The progress made in the campaign for the improvement of medical education was more rapid, and fewer difficulties were experienced than were anticipated at the beginning of the campaign. This was due largely to the cordial and ready cooperation by the officers of medical colleges and state licensing boards, both individually and in their national organizations. The publicity secured by the report of the Carnegie Foundation for the Advancement of Teaching aided generally in the campaign, and particularly in calling the attention of philanthropists to the financial needs of medical schools. The object sought has been attained, and medical education in the United States is now equal to, if it does not surpass, that in any other country.

THE METABOLISM OF NERVES

Although chemical change is today regarded as one of the most fundamental characteristics of biologic processes, it has not been easy to secure clear-cut evidence of such transformation of matter in the instance of the function of one of the important components of the body, the nervous tissue. For many years students of metabolism devoted energy and ingenuity to the task of detecting the possible wastes and catabolic products arising in the activity of the nervous structures. Comparisons of energy transformations and urinary composition were made under conditions of profound rest and nervous excitement or mental performance, without disclosing differences sufficient to warrant any conclusion respecting the possible chemical changes in nervous tissue incident to its normal functioning. At most, this outcome might be construed to indicate that such reactions as do occur are attended with changes too small to be measurable by the methods at our disposal. Furthermore, as a human adult weighing 150 pounds (68 kg.) has only 1.6 kg. of nervous tissue, or about one fortieth of his body weight, according to Donaldson, it is not surprising if even considerable increments or decrements in some of the normal catabolites of the organism, attributable to alterations in the small total amount of nervous tissue involved, should escape recognition in the larger total of the entire mass of chemically active tissues.

Nevertheless, there have been indications derived from other methods of investigation, notably the study of isolated nerves before and during stimulation, that have pointed significantly in the direction of chemical changes occurring in connection with the demonstrable physiologic reactions. In particular, Tashiro,[1] has been assiduous in his efforts in this field of study; by the use of an ingenious technic he has demonstrated that the resting nerve respires (that is, gives off carbon dioxid), and that this respiration increases during the passage of the impulse. His latest contribution,[2] also secured with the aid of microchemical methods, supplements the previous records with the demonstration that the nerve undergoes chemical reactions in which both acid-forming and base-forming substances are produced, the increase of carbon dioxid production during stimulation being accompanied by an increased production of a base, presumably ammonia. The difficulties of such research become more apparent from the statement that the methods employed permit the measurement of as little as 0.0000001 gm. ($\frac{1}{640000}$ grain) of ammonia.

It is idle at present to speculate on the significance of this discovery. The quantities of ammonia actually detected by Tashiro would correspond to 0.7 gm. a day for adult man, an amount so large that it must be assumed, in the absence of further information, that part of the nitrogenous base thus formed is reconverted into other products, such as urea. For the moment, the outstanding feature is the evidence that nerves, in common with other tissues, experience a nitrogenous metabolism.

1. Tashiro, S.: Am. J. Physiol. **32**: 107, 1913.
2. Tashiro, S.: Studies on Alkaligenesis in Tissues, I, Ammonia Production in the Nerve During Excitation, Am. J. Physiol. **60**: 519 (May) 1922.

THE PATHOLOGY OF AVITAMINOSIS

Much of the current vitamin hypothesis, at least so far as it concerns so-called vitamin B, received its earliest formulation from the outcome of studies of beriberi in the Far East. Eijkman, the pioneer in this field of investigation, designated the beriberi-like symptoms which he induced experimentally in fowls through feeding diets of polished rice as polyneuritis gallinarum. Other observers designated human beriberi as panneuritis endemica or neuritis multiplex endemica; and, accordingly, the human disease as well as the experimental beriberi of birds came to be regarded almost universally as a true polyneuritis—a degenerative, inflammatory condition of the peripheral nerves. The onset of the disease has become associated with a deficiency in the diet. Funk, who succeeded in relieving the characteristic disturbances in muscular coordination exhibited by birds on diets of milled rice, designated the hitherto unidentified dietary essential that promptly dispels the symptoms as the antiberiberi vitamin. From such beginnings the application of the word vitamin has gradually expanded until it is now used in a generic sense to indicate each of a number of distinct dietary factors which have not yet been identified, and which have in common the fact that they apparently are needed only in small quantities. In this respect, whatever they may prove to be in chemical composition, they differ from the common sources of energy and certain inorganic salts for which the need is measurably large.

Presently it was further demonstrated, notably through the researches of Hopkins in England and of Osborne, Mendel and McCollum in this country, that other species than man and birds suffer from

comparable deficiencies in the diet, and are relieved or cured when the "accessory factors" are supplied. Somehow there has been a more or less tacit assumption that the "deficiency disease" of rats, mice, dogs, etc., deprived of sources of vitamin B is analogous to or identical with beriberi and polyneuritis gallinarum. Hofmeister [1] has recently made a study of the pathology of the nervous system in rats deprived of vitamin B, which leads him to protest against designating their symptoms as those of polyneuritis in the conventional sense. He was unable to discover any anatomic changes that can be designated as peripheral degeneration. The demonstrable lesions consist of alterations in the central nervous system in the severer types of deficiency disease. Most conspicuous are the multiple hemorrhages in the cerebellum and midbrain, followed by degeneration of associated nervous structures. There is an evident parallelism between the intensity of the nervous symptoms observed before death and the extent and distribution of the hemorrhagic damage. The pathology of the disorder, in rats, is comparable not with typical polyneuritis, but rather with a hemorrhagic encephalitis. Something similar is often observed in chronic intoxication with alcohol and certain heavy metals.

Evidently there is no longer any justification for glibly designating all avitaminosis of the classic type —the result of lack of vitamin B—as polyneuritis or beriberi. Experimentalists have repeatedly raised the question as to the propriety of identifying as antineuritic vitamin the vitamin factor that restores growth and health, when animals have been deprived of it in their food. It is becoming more apparent in the experimental avitaminosis of animals, as it has long been evident in the clinic of human beriberi, that the effects may be manifold in character and that the nervous system may not be the only part of the organism seriously involved. We are only at the beginning of the pathology of avitaminosis.

1. Hofmeister, F.: Studien über qualitative Unternährung, I Mitteilung, Die Rattenberiberi, Biochem. Ztschr. **128:** 540 (March 28) 1922.

Three Significant Medical Pamphlets.—Three small booklets, says Dr. A. Gilbert of Paris, have influenced considerably the development of the Paris Medical School. They are: *Statuts de la Faculté de médecine de Paris* (statutes of the School of Medicine of Paris); *Les rites, usages et louables coutumes de la Faculté de médecine de Paris* (Rituals, practices and praiseworthy customs of the School of Medicine of Paris); and *Calendrier médical à l'usage de la très salutaire Faculté parisienne* (Medical Calender prepared for the use of the most healthgiving Paris Faculty). The statutes or by-laws date from the twelfth century and were revised several times until 1751, when the last Latin edition was published. This was translated into French in 1754 by a naturalized Englishman, Bermingham. The by-laws remained in force until the school was closed by the French Revolution. The school was always very proud of its prerogatives as set down in the pamphlets, conformed its policy strictly to them through the centuries, and upheld their provisions even against the king.

Current Comment

REFERENDUM ON MISSOURI MEDICAL COLLEGE BILL DENIED

Early in 1921, a law was passed by the Missouri legislature removing the word "reputable" from the clause in the medical practice act relating to medical colleges. This took away from the state licensing board the authority to refuse to admit to its examinations graduates of low-grade medical schools. In spite of the protests of many prominent citizens and of the medical profession of the state, the bill was signed by the governor. Taking advantage of the provision for a referendum on bills of this sort, the medical profession, in a whirlwind campaign, secured 76,000 signatures to petitions asking for a referendum. The circuit court of Cole County ruled, however, that the petitions from one district did not contain the number required by law—the deficiency consisting, it is reported, of only four signatures! On July 18 of the present year, the state supreme court sustained the ruling of the circuit court, thus preventing the bill from being submitted to a referendum vote. The law enacted in 1921, therefore, now goes into effect. This law, it is understood, was passed under pressure brought by the friends of three medical colleges—one in St. Louis and two in Kansas City—which were not deemed reputable by the Missouri State Board of Health. The law does not help these colleges much since, even though they have forced recognition in Missouri, they still remain unrecognized in more than forty other states. The effect on the state, however, is disastrous, since the emasculation of the medical practice act makes Missouri the dumping ground, not only for the graduates of the three low-grade medical colleges within its borders, but also for the hordes of the ill-trained graduates of low-grade colleges of other parts of the country—graduates which forty other states will not accept. It is the people of Missouri who have to suffer for the ill-advised action of its lawmakers and public officials to whom they rightfully looked for protection.

THE ASPIRATION OF DUSTING POWDER—MENACE TO INFANTS

The comforts which progress has brought to mankind have not always been unalloyed blessings. Now and then, novel elements of danger or potential sources of harm attend the innovations of changing modes of life. Public health and personal welfare demand unremitting vigilance in the more strenuous, even if more tolerable, struggle for existence. Harm may lurk in unsuspected places. An illustration has recently been afforded by the report of Heiman and Aschner [1] of Mount Sinai Hospital, New York, on the effects of the aspiration of zinc stearate powder. Ever since the latter has begun to replace the long familiar talcum as a dusting powder in the nursery, there have been records of untoward results following accidental

1. Heiman, Henry, and Aschner, P. W.: The Aspiration of Stearate of Zinc in Infancy: A Clinical and Experimental Study, Am. J. Dis. Child. **23:** 503 (June) 1922.

aspiration of the dust by children, to whom the containers are usually readily accessible. In some cases bronchopneumonia of a more or less fulminating type has ensued; in other infants an acute toxemia was the most conspicuous symptom; occasionally an initial partial asphyxia passes off without definite pulmonary involvement. Insufflation pneumonias produced with noninfective particles are well known in experimental pathology. Evidently the pneumonic lesions due to zinc stearate are analogous in origin. Talcum is probably capable of producing damage similar in type but lesser in degree; for whereas zinc stearate is tenacious, the physical properties of the talcum may permit easier expulsion of the foreign particles. At any rate, Heiman and Aschner frankly believe that the zinc stearate container, with its large perforations, as now prepared for the nursery is a distinct menace to the health of infants. Illuminating gas is a potential danger to grown-ups, but they have learned the way of safety without giving up the advantages of the toxic product.

STATE UNIVERSITIES AND HOMEOPATHY

In the past, several state universities, in response to political clamor, established departments of homeopathy and even of eclectic medicine in addition to their regular colleges of medicine. At the University of Nebraska, both homeopathic and eclectic departments were established in 1883. The eclectic department became extinct, however, in 1885, and in 1887 the university ceased to teach medicine altogether when the regular and homeopathic departments also were closed. The university did not resume the teaching of medicine until in 1902, when the present college of medicine was established. The homeopathic department was established at the University of Michigan in 1887; at the State University of Iowa in 1878; at the University of Minnesota in 1889, and at the Ohio State University in 1915. Thus each of these universities had two colleges of medicine and two groups of medical students. With the development of laboratory instruction, the students of the two colleges were taught together during the first two years by the professors of the college of medicine, but in the clinical subjects they were taught in two separate departments. There was a duplication in the instruction in the clinical subjects, therefore, in addition to the courses in materia medica and practice—the only subjects in which different points of view were held by the two colleges. Another irregularity arose when the colleges of medicine increased their requirements for admission to two years of college work, while the homeopathic colleges in three of the universities continued to require only a high school education or, later, one year of college work. Thus, during the first two years the classes in medicine included students admitted on two different grades of entrance qualifications. At the University of Minnesota, however, the higher entrance requirements were put into effect in the two colleges in the same year and within the next few years the enrolment in the homeopathic college dropped to so small a number that the college was abolished by the board of regents, and elective chairs in homeopathic materia medica and practice were established. This happened in 1909. Similar action was taken at the State University of Iowa in 1919, and during the present summer at the Michigan and Ohio State universities. At the Ohio State University, however, there are no elective chairs in homeopathic materia medica and practice. It was a glaring inconsistency for any reputable university to enter on the teaching of scientific medicine and at the same time establish a college to furnish instruction which was avowedly based on an unproved and narrow theory. It is encouraging, therefore, that all of our great universities have abandoned the support of any form of sectarian medicine and are leaving their medical teachers free to adopt and make use of any method or agency which, on due investigation, is found to be of value in the diagnosis, treatment or prevention of human diseases.

AGAIN THE POOR BOY AND MEDICAL EDUCATION

Long before the campaign began for the improvement of medical education, appeals were frequently being made for "the poor boy who wants to get a medical education," and, as the higher entrance standards began rapidly to be adopted by medical schools, appeals of this kind were repeatedly commented on by THE JOURNAL. The situation for the poor boy today is better, if anything, than it was twenty years ago. It is true that medical colleges have increased their requirements for admission from a high school education to two years of college work. The two years of college work, however, are no hindrance to the poor student; there are many colleges which provide abundant opportunities whereby students of limited means may work for all or part of their expenses. More time, indeed, is required, but these two years are well spent by the student in securing a better preparation for his medical studies. It is true, also, that the cost of conducting a medical school has been greatly increased during the last twenty years; but, during the same time, the fees paid by medical students have been only moderately advanced and cover only a small portion of the cost. Even the slightly increased fees, however, are more than offset by the establishment of free scholarships and generous loan funds in the better grade medical schools. The opportunities for the student of limited means to secure a medical education have in no way been diminished. As a matter of fact, the anxiety which is still being expressed for the boy who is poor in purse but not in intelligence is not warranted by the facts. Investigation discloses that many students of limited means are found in all of our high-grade medical schools, in which these students are enabled in various ways to work their way through. Meanwhile, it is the student of limited means who, as a rule, best appreciates the value of both time and money. He is not enticed by the pretentious statements of low-grade medical colleges, but usually selects the better institution. It is quite evident, therefore, that the improved standards of medical education are not hindering the student who is poor in purse from obtaining a medical education.

Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST: SUCH AS RELATE TO SOCIETY ACTIVITIES, NEW HOSPITALS, EDUCATION, PUBLIC HEALTH, ETC.)

ALABAMA

Hospital News.—The contract has been awarded for the new fifty-five bed hospital building to be erected at Birmingham. The institution will be known as the Birmingham General Hospital and will be operated by railway brotherhoods.——Formal resolutions for the joint upkeep of the Red Mountain Sanatorium, Birmingham, until the Ketona Sanatorium for tuberculous patients is erected, were passed by the board of revenue, July 26. When the permanent institution is erected, the board will maintain it on a fifty-fifty basis with the city. The Red Mountain Sanatorium was recently discontinued by the antituberculosis association.

Renovation of Eleemosynary Institutions.—Since October, 1919, renovations have been made at every eleemosynary institution in the state, and every institution will be thoroughly renovated by January, 1923. A modern hospital has been equipped by the state at the Boys' Industrial School, East Lake. Birmingham physicians who donate their services are in attendance. A new hospital has been erected at the State Training School for Girls, near Powderby. The first unit of the Home for Mental Inferiors has been completed near Tuscaloosa. This institution was authorized by the legislature in 1919. The Bryce Insane Hospital at Tuscaloosa is being generally renovated by the state. Extensive alterations have also been accomplished at the Searcy Insane Hospital for Negroes, at Mount Vernon.

CALIFORNIA

Hospital News.—The Covina Hospital, Covina, was formally opened to the public, July 20.——The heroism of Mrs. Ethel Moyer, Oakland nurse, who sacrificed her life to save the patients when the Hetch Hetchy Hospital burned, July 27, will be appropriately commemorated. The new hospital building planned to replace that destroyed will be called the Ethel Moyer Memorial Hospital.——The Horseshoe Sanatorium is being erected at Horseshoe Valley by Chester Conklin, screen comedian. Dr. John T. Bernard, former medical director of the Kern County Hospital, will be in charge of the sanatorium.

University of California.—Professor Samuel S. Maxwell, for several years associate professor in physiology, University of California, will head the medical department of the university with the opening of the fall semester, it was recently announced. Dr. Robert A. Gesell, professor of physiology, and Prof. Victor E. Emmell, Ph.D., associate professor in anatomy, have resigned. Prof. W. R. Bloor, Ph.D., professor of biochemistry, has resigned and will enter private practice. Professor Meyer will spend the next year on leave of absence studying in Switzerland, and Dr. Frederick P. Gay, professor of bacteriology, will study in the East for one year.

CONNECTICUT

Personal.—Dr. Thomas A. Woodruff, who gave up his practice to take over the management of the Lincoln Paper Mills at St. Catherines, Canada, has resigned that position and will resume the practice of ophthalmology at New London.——Dr. Harold W. Hersey, superintendent of the New Haven Hospital, has resigned to go on the administrative board of Columbia University and the Presbyterian Hospital, New York.

DISTRICT OF COLUMBIA

Home Care for Dependent Children.—Senator Calder of New York has introduced a bill in the Senate providing home care for dependent children of the District of Columbia.

FLORIDA

Personal.—Dr. Ralph N. Greene has been appointed the new director of St. Luke's Hospital, Jacksonville.——Dr. Jay A. Powell, West Palm Beach, has been appointed to succeed Dr. Albert H. King, recently deceased, as county physician and superintendent of the County Poor Farm.——Dr. Ernest B. Milam, Jacksonville, has been named to do the laboratory work for the Florida subdistrict office of the U. S. Veterans' Bureau.

Maternity Welfare.—A feature of the service under the Sheppard-Towner act in Florida will be a series of letters which will be sent out monthly to persons desiring them. About fifty have already registered for this series of educational letters and are receiving them from the state board of health. Under the provisions of the act, funds may not be applied to the purchase, erection, preservation or repair of any buildings or equipment, nor for the purchase or rental of any buildings or lands, nor for payment of any maternity or infancy pension, stipend or gratuity. The funds will be used to pay for the preparation of literature, the dissemination of the educational information and the employment of field workers and directors.

GEORGIA

Statue of Long in the Hall of Fame.—A resolution was presented to the House of Representatives of Georgia, July 12, to launch a campaign for $12,000 to place statues of Alexander H. Stephens and Dr. Crawford W. Long in the Hall of Fame, at Washington, D. C. The resolution provides for the appointment of three members of the house and two of the Senate to act with a committee of citizens to raise funds for the memorial.

ILLINOIS

Dr. Furstman Resigns.—Dr. Jacob M. Furstman has resigned as city health director of Bloomington to take effect August 31. Dr. Furstman will assume the duties of director of health of the Peoria public schools, having been elected by unanimous vote of the Peoria Board of Education.

Governor Dismisses Miller.—It is reported that Governor Small has dismissed W. H. H. Miller, director of the state department of registration and education, who was indicted by the grand jury at Chicago on a charge of selling numerous physicians' licenses and druggists' certificates. A. M. Shelton, Crystal Lake, for twelve years superintendent of schools in McHenry, has been appointed to succeed him. Miller's dismissal followed his refusal to resign after a medical board had recommended his removal some months ago and hundreds of letters from all parts of the state had been sent to Governor Small attacking Miller's administration.

Birth Registration Test.—Announcement has been made that the U. S. Bureau of the Census will make a test in Illinois during September and October of this year to determine how completely births are being reported. In anticipation of the test, the state director of public health has carried out a vigorous campaign in behalf of prompt and complete returns. Every practicing physician in the state whose correct name and address were obtainable has received a letter urging him to report at once all unregistered births that had occurred in his practice and to be especially prompt with current and future reports. County medical societies have also been solicited, with gratifying results, for active cooperation in this connection. A few delinquent physicians have been prosecuted. As a result of these activities, birth registration has increased about 10 per cent. during the last twelve months, and it is felt that this, coupled with renewed cooperative efforts on the part of physicians, will indicate a registration sufficiently complete to make Illinois eligible for the U. S. Registration Area.

Chicago

Personal.—Dr. Francis J. McNamara, chief physician of the Cook County Jail, Chicago, is successfully recovering from an appendectomy performed, August 1, at the Michael Reese Hospital.

INDIANA

Personal.—Dr. William F. King has been appointed secretary of the state board of health to succeed Dr. J. N. Hurty, resigned.——Dr. Frank M. Stackhouse, Kingman, will give up the practice of medicine for newspaper work. He has purchased an interest in a newspaper in Ohio.——Dr. Charles R. Doyne has been appointed chief of staff at the Indiana State Hospital for the Insane at Madison.——Dr. Forrest A. Chenoweth, Winchester, has been appointed by the U. S. Pension Board as a member of the Randolph County Board to succeed Dr. Charles E. Milligan, deceased.

IOWA

Personal.—Dr. Jeannette F. Throckmorton, Des Moines, is in England attending the Royal Institute of Public Health.——Dr. Walter L. Bierring, Des Moines, has just returned

from a trip abroad where he was awarded an honorary degree and membership in the Royal College of Physicians of Edinburgh, Scotland, July 18—a precedent of a hundred years' standing being broken on that occasion, it is stated. Another purpose of Dr. Bierring's trip was to investigate qualifying examinations for physicians on behalf of the National Board of Medical Examiners, in order that the examinations of America and Great Britain may be harmonized in such a way that physicians from either country will be recognized in both lands.

LOUISIANA

Eight Milk Dealers Fined.—Charged with violating the city milk ordinances, eight milk dealers of New Orleans were fined from $10 to $25 each, July 19, by Judge Leininger.

Personal.—Dr. G. W. Stephens, formerly of Shreveport, recently returned to the United States from Great Britain. Dr. Stephens, while practicing in Manila, P. I., joined the medical corps of the British Army as a captain, at Hongkong, in 1914. Since then he has served with the R. A. M. C. at Gallipoli, with Allenby in Palestine, and recently in Ireland. He was mustered out a few weeks ago and will return to his home in the South.——Dr. Charles H. Voss, New Orleans, will sail shortly for China as a medical missionary under the auspices of the foreign mission board of the Southern Presbyterian Church. Dr. Voss will sail, September 2, following a foreign missions conference at Montreat, N. C. He will be surgeon in charge of the Elizabeth Blake Hospital at Soochow.

MAINE

Sanatorium Dedicated.—The Presque Isle Sanatorium at Presque Isle, Houlton, was dedicated and formally opened to the public at the end of June. In connection with the opening, a house party was held to which all nurses in Aroostook County were invited.

New Hospital at Belfast.—A new hospital will be erected at Belfast at a cost of $40,000. This institution will be known as the Bradbury Memorial Hospital. Mr. and Mrs. Charles Bradbury of Belfast gave the C. Y. Cottrell estate to Dr. Eugene D. Tapley and on his death it will pass to the city. Many residents have donated sums of money and furniture for the new institution.

MARYLAND

Johns Hopkins University.—In the faculty of hygiene and public health of Johns Hopkins University, Baltimore, Dr. William W. Ford has been appointed professor of bacteriology, and Dr. Carroll G. Bull professor of immunology. In the faculty of medicine, Dr. Warfield T. Longcope has been made professor of medicine; Dr. Harold L. Amoss, associate professor of medicine; Dr. Robert S. Cunningham, associate professor of anatomy; Dr. William S. McCann, associate professor of medicine; Dr. Arthur L. Bloomfield, associate professor of medicine; Dr. Benjamin Kramer, associate professor of pediatrics; Dr. Esther L. Richards, associate professor of psychiatry; Dr. Albert Keidel, associate professor of clinical medicine; Dr. Wilburt C. Davison, associate in pediatrics; Dr. Leslie B. Hohman, associate in psychiatry; Dr. Phyllis G. Richter, associate in psychiatry; Dr. Emil Novak, associate in clinical gynecology; Dr. Ernest H. Gaither, associate in clinical medicine; Dr. Wilder G. Penfield, associate in neurology, and Dr. J. Earle Moore, associate in clinical medicine.

MASSACHUSETTS

Chiropractor Fined.—It is reported that Henry N. Doerr of Lawrence was fined $100 in a district court recently for practicing medicine without a license. State Officer Griffin stated that chiropractors were not allowed to practice in Massachusetts. The defendant appealed.

Harvard Cancer Commission.—The Harvard Corporation has recently announced the names of the members of the Cancer Commission and the officers of the Collis P. Huntington Memorial Hospital, their term of office to commence in September. Dr. Robert Battey Greenough has been reappointed director of the Cancer Commission and surgeon-in-charge at the Memorial Hospital. The others on both staffs are: the Cancer Commission, Dr. Channing Chamberlain Simmons, secretary; Dr. James Homer Wright, pathologist in charge of the free diagnosis service; William Duane, research fellow in physics; Dr. Henry Lyman, research fellow in chemistry; William T. Bovie, research fellow in biophysics; Dr. Stuart Mudd, assistant research fellow in biophysics; Charles Elisha Barr, research fellow in biophysics, and Walter Scott Hughes, assistant in biophysics. Huntington Memorial Hospital, Dr. Channing Chamberlain Simmons, surgeon; Dr. George Gilbert Smith, surgeon; Dr. George Adams Leland, Jr., assistant surgeon; Dr. Henry Asbury Christian, consulting physician; Dr. George Richards Minot, physician; Dr. Thomas Ellwood Buckman, assistant physician; Dr. Ernest Merrill Daland, surgeon to outpatients; Dr. Leland Sterling McKittrick, surgeon to outpatients; Dr. Daniel Crosby Greene, laryngologist; Dr. Lawrie Byron Morrison, consulting roentgenologist; Dr. Roy Green Giles, roentgenologist, and Dr. Arthur Moses Greenwood, assistant dermatologist.

MINNESOTA

Personal.—Dr. John W. Trippie of the Aberdeen Hospital for war veterans in St. Paul has been appointed as medical officer in charge of a new hospital for disabled soldiers in Memphis, Tenn.——Dr. Albert F. M. Green has resigned as staff physician at the Fergus Falls State Hospital, to accept the position of assistant superintendent at the New York Reformatory for Women, Bedford Hills, N. Y.——Dr. Bert G. Anderson, who has charge of the oral diagnosis at the Earl Clinic, St. Paul, has sailed for Pekin, China, where he will be instructor in the Peking Union Medical College.

Health Exhibits at State Fair.—Unique exhibits and entertainment features are being planned by seventeen public health agencies of the Twin Cities and the Northwest, for the purpose of educating visitors to the Minnesota State Fair in matters of health. This is the third year that a special building has been set aside at this fair for public health activities, and the Minnesota State Fair Board was the first board of its kind in the United States to create a special department of public health for a state fair. Subjects to be placed before fair visitors will include facts about preventable diseases; sanitation with reference to milk and water, and sewage disposal; venereal diseases; vital statistics, and child hygiene.

MISSOURI

Annual Clinic Week.—The Academy of Medicine of Kansas City has voted to establish a clinical week during the month of October every year. The clinics this year will be held, October 3-6. A banquet will be held October 4.

Gift to University.—The Wintersteiner Collection of 13,000 microscopic preparations of pathologic changes in the eye has been acquired by the St. Louis University through the generosity of Mr. Charles Rebstock of St. Louis. This collection, which is said to be the most complete in Europe, will be utilized for graduate instruction in ophthalmology.

MONTANA

State Public Health Association.—At the annual meeting of the association in Great Falls, Dr. Dean Lewis, Chicago; Dr. Ernest M. Hammes, St. Paul; Dr. James J. Waring, Denver, and Dr. Frederick C. Rodda, Minneapolis, gave addresses. Dr. George A. Fuson, Kalispell, Cascade County health officer, was elected president of the association, and Dr. William F. Cogswell, Helena, secretary of the state board of health, was elected secretary.

Health Conference.—A number of scientists doing research on spotted fever held a conference at Hamilton, recently, in the laboratory maintained there by the U. S. Public Health Service. Drs. Parker and Spencer, in charge of the work; Dr. Lunsford D. Fricks, in charge of the tick investigation work; Dr. T. N. King, representative of the bureau of entomology, and Dr. William F. Cogswell, secretary of the state board of health, were present. There have been several deaths in Montana this year from spotted fever, while the malady has also taken toll in Idaho, eastern Washington, Oregon, Colorado, Wyoming and Utah.

NEW YORK

Physician's License Revoked.—Official communication from the board of regents of the University of the State of New York states that the license of Dr. Joseph Arthur Talamo was revoked, June 27, for irregularity in his credentials.

New York City

Social Service Ward at Hospital.—St. Mark's Hospital recently opened a free social service ward for women and children to which all social agencies, hospitals, dispensaries and physicians are urged to refer their patients. The purpose

of this ward is to give careful and scientific study and treatment to cases involving venereal disease and allied problems in the personal and family relations.

Public Health Lecture Program.—The bureau of public health education of the department of health will be prepared, beginning October 1, to give lectures on a wide range of subjects coming under the headings of personal hygiene and preventive medicine, industrial hygiene and sanitation, and on special diseases, as cancer, anthrax, heart disease, nephritis, diabetes and diseases of the circulatory system. Organizations desiring these lectures may communicate with the bureau. Specialists in these various fields who will volunteer to deliver lectures are invited to furnish the director of the bureau of public health education with information as to the subjects on which they are prepared to lecture and the times when they will be available. From January to May, 1922, a total of 1,875 lectures were furnished by the bureau, which reached an audience of 57,668 persons. Foreign language talks were given in Syrian, Italian, Russian, Yiddish and Spanish.

NORTH CAROLINA

Large Clinic Opened.—The Lenoir Clinic was opened at the beginning of August in Kinston. Ten rooms will be used for laboratory, consultation, administration and emergency hospital purposes. A number of whole and part-time physicians and nurses will be employed, together with sanitary inspectors, etc. An automobile has been donated by the negro citizens for the use of a nurse to work among them. Dr. William F. Hargrove donated a hospital table, and other gifts of operating tables and furnishings have been given by residents of Kinston.

OHIO

Cincinnati Hygiene Society.—At the recent annual meeting of the Cincinnati Social Hygiene Society, the following officers were elected for a fourth term: president, Dr. William S. Keller; vice president, Dr. Edwin W. Mitchell, and secretary-treasurer, Dr. Elizabeth Campbell.

Tribute to Deceased Physician.—In honor of the late Dr. George Burnet Orr of Cincinnati, a memorial window has been placed in Christ Episcopal Church, Cincinnati. The window, which was made in London, is the gift of Dr. Orr's family. The scene pictures the healing work of Christ's ministry.

Health Lectures for Teachers.—Beginning July 31, eighty counties will hold teachers' institutes until September 7. A speaker on health subjects is scheduled to appear at each, in connection with the recent health instructions given to students in Ohio by the department of education and the health department.

OKLAHOMA

Personal.—Dr. Cary W. Townsend has been appointed city physician of Oklahoma City, to succeed Dr. Joseph T. Martin who resigned June 1.——Dr. James Winter Brown, Tulsa, was recently successfully operated on for a brain tumor by Dr. Harvey Cushing at Boston. He is still in a very serious condition.

OREGON

Eastern Oregon District Medical Society.—The annual meeting of the society was held at Baker City, July 20, under the presidency of Dr. T. J. Higgins.

Hospital News.—A large residence owned by the Hembree estate, McMinnville, has been purchased for a hospital. Dr. Morrison of Carlton has furnished some of his hospital equipment, supplementing that of Dr. M. E. Reitzel, who will be director of the institution. Mrs. Versteeg will be matron. ——The Eugene Bible University will erect a hospital and sanatorium at Eugene in the near future it was recently announced. An initial expenditure of $100,000 will be made on the two institutions, which will be located in different parts of the city, and as the demand for more room grows the buildings will be enlarged. The first unit will have accommodation for 100 patients. It is understood that the institutions will be a center for the training of nurses for the foreign missionary field.

PENNSYLVANIA

Typhoid in Miners' Camps.—It is reported that typhoid fever has developed in the tent colonies of the striking miners throughout Fayette County. These miners had been drinking water from a spring that was closed by the authorities, August 7. A general investigation is being conducted in every mine settlement where evicted miners living in tents, and poorly fed and clothed, have been depending on springs, wells and creeks for their water supply. Dr. C. A. Atman, Fayette County representative of the state board of health, is in personal charge of the work. The spread of the disease is said to be rapid, more than fifty cases being reported in a few days.

Hospital News.—Construction work in York on an institution to be known as the White Rose Hospital will be started this summer.——Plans are being drawn for a hospital for Jersey Shore.——Cambria County will erect a new sanatorium at Ebensburg. It will be known as the Cambria County Tuberculosis Sanatorium.——A three-story brick structure costing $30,000 will be erected at Houston, to be known as the Francelia Bell Home for Old Ladies.——Plans are being drawn for the new Luzerne County Tuberculosis Hospital, to be erected at Drums. A nurses' home and a residence for the superintendent will be built, and the hospital will have accommodations for 100 patients.——A. W. Newell, Pittsburgh, has been appointed superintendent of the McKeesport Hospital, McKeesport, to succeed David F. Owen, who resigned to accept the superintendency of the Uniontown Hospital at Uniontown.——A nurses' home will be added to Windber Hospital.—— A new ward building and nurses' home are under construction at the Harrisburg Hospital. The ward building will be erected at a cost of $315,000. The nurses' home will be erected on River Street at a cost of $155,000.—— Harriman Hospital, Bristol, was recently opened for inspection and the reception of patients. What was formerly the town of Harriman has become part of Bristol. Dr. George T. Fox, Bristol, acquired the building and equipment from the United States government, and has had it thoroughly renovated. While it will be a private hospital, it has been placed at the disposal of the citizens of Bristol.

Philadelphia

Health Campaign.—As part of a vigorous campaign by the department of health against insanitary housing conditions, forty-six offenders against sewage requirements were arraigned before Magistrate Renshaw for failure to comply with instructions to underdrain cesspools. More than half the offenders were fined from $4.50 to $25 and costs.

Physicians Ask Charter.—A number of prominent physicians joined in application in Common Pleas Court No. 5 for a charter for the Philadelphia Association for the Prevention and Relief of Heart Disease. The purposes for which the corporation is formed are to present to the public the great problem of heart disease; to offer a channel through which these problems may be approached, and by the scientific study of heart disease by the organization of heart clinics, by vocational guidance, by institutional care, and by the building and maintaining of convalescent homes, to make those suffering with heart disease more useful and contented members of society. In October, members of the society will go before the board of education to ask for specially constructed school buildings for children with heart disease. The efficiency of children has been raised 100 per cent. in New York by that means. Plans have been made for public lectures on the subject and lectures to nurses and schoolchildren. A hospital for the care of 100 children convalescent from heart disease will be built. Additional clinics will be established in the city hospitals to which all persons with the disease can report once a month for examination and care. Dr. Joseph Sailer is president of the society; Dr. George W. Norris, vice president, and Dr. William D. Stroud, secretary.

SOUTH CAROLINA

Memorial to Dr. Lynah.—The American Bronchoscopic Society has established a scholarship at the Medical College of the State of South Carolina, Charleston, in memory of the late Dr. Henry Lowndes Lynah, a graduate of that institution in 1900, formerly of Charleston and recently of New York. A resolution was adopted at the last meeting of the society that a scholarship of $100 be voted annually in memory of Henry L. Lynah, one of the founders of the society, to be applied to a scholarship to be established at the South Carolina Medical College, and that the dean of the medical school be empowered to award the scholarship to a deserving student.

UTAH

Personal.—Dr. Andrew J. Hosmer, Salt Lake City, has sailed for Europe.——Dr. George E. Robison, formerly of the Provo General Hospital, has gone to Salt Lake City to take

up the roentgen-ray work formerly carried on by Dr. Charles W. Stewart, who has left the city and will reside in Los Angeles.

New Medical Society.—The first meeting of the Carbon County Medical Society was held at Price, July 14. The following officers were elected for the ensuing year: president, Dr. Frank F. Fisk, Price; vice president, Dr. Claude M. McDermid, Castle Gate, and secretary-treasurer, Dr. John A. Judy, Price. This society was organized, June 24, with headquarters at Price.

CANADA

University News.—A committee was appointed during the last session of the Ontario Legislature to investigate matters relating to the management of the University of Toronto, in its relation to the federated colleges and the medical council. ——The faculty of McGill University, Montreal, Quebec, has announced that the number of first year students will be limited to 100. The standard of admission will be senior matriculation of first year arts.——Construction of the new library for Queen's University, Kingston, Ont., will be commenced shortly. Estimates call for an expenditure of over $225,000.

Personal.—Dr. Madeleine de Rouville, chief of one of the clinics in Paris, recently arrived in Toronto, Ont., on a tour of study that will cover the whole continent. The lectures which Dr. de Rouville will deliver in Canada will be translated into English, and will be subsequently read before medical students at the University of Toronto.——At the annual convention of the National Council for Women at Fort William, June 25-28, Dr. Augusta Stowe-Gullen, Toronto, was elected provincial president for Ontario.——W. P. Mustard, Ph.D., of Johns Hopkins University, has been elected a corresponding fellow of the Royal Virgilian Academy of Mantua. Dr. Mustard is the first Canadian to receive this honor, it is alleged.

Public Health News.—The provincial board of health of Ontario has made arrangements to install a booth at the coming Canadian National Exhibition, where information on questions of public health will be supplied free of charge. The booth will be in charge of Dr. J. J. Middleton.——The outbreak of infantile paralysis is assuming alarming proportions in Hamilton, Ont. There have been three deaths reported so far, in a total of forty cases. Public places where children congregate will be closed by the board of health. The total number of cases in Brantford, Ont., has risen to five, with one death.——According to a recently issued health bulletin by Dr. C. J. Hastings, medical officer of health, Toronto, there were more deaths in Toronto, in 1921, from venereal diseases, than from either cancer or tuberculosis. There are six venereal disease clinics in Toronto, and during 1921 33,322 cases were given treatment.

Society News.—The second annual meeting of the Canadian Society of Anesthetists was held in Winnipeg, in conjunction with the Canadian Medical Association, under the presidency of Dr. Samuel Johnston. The following officers were elected for the ensuing year: president, Dr. David H. Arnott, London; vice president, Dr. Walter L. Muir, Halifax; executive for the United States, Dr. F. Hoeffer McMechan, Avon Lake, Ohio, U. S. A., and secretary-treasurer, Dr. Wesley Bourne, Montreal. Dr. Elmer I. McKesson, Toledo, Ohio, president of the National Anesthesia Research Society, spoke on "Eleven Years' Observation of the Minute Volume of Respiration in Anesthesia."——At the meeting of the Simcoe County Medical Association, July 6, in Barrie, Ontario, Dr. C. G. Rutherford, Orillia, was elected president, and Dr. Harry T. Arnall, Barrie, was elected secretary.——At the last meeting of the Hastings County Medical Association, at Belleville, Dr. William M. Mather, Tweed, was elected president and Dr. T. Daley, secretary-treasurer.——The third annual outing and meeting of practitioners of District No. 9 of the Ontario Medical Association was held at Sudbury, Ont., August 2. Addresses were delivered by Drs. E. W. Ross, F. W. Marlow, F. W. Routley, and R. I. Harris, of Toronto; also by Drs. G. W. Smith, North Bay; J. S. Freeborn, Magnetewan, and E. R. Secord, Brantford. The meeting was held under the auspices of the Sudbury District Medical Society, Dr. W. J. Cook of Sudbury being in charge.

GENERAL

Public Health Nursing on Indian Reservations.—To test the feasibility of public health nursing on the Indian reservations, the American Red Cross has inaugurated a survey among the Navajo, Pima and Popago and other reservations of Arizona, New Mexico and South Dakota. Three Red Cross nurses have been assigned to the survey, and the Red Cross has appropriated $9,000 to cover their salaries and expenses. The test is being made at the request of Charles H. Burke, U. S. Commissioner of Indian Affairs.

American Academy of Ophthalmology and Otolaryngology.—At the annual meeting of the academy, which meets in the Twin Cities, September 19-23, Prof. Robert Bárány, formerly of Vienna, and now of Upsala, Sweden, will be the guest of honor. He will present a paper entitled "A New Method of Radical Operation for Chronic Suppuration of the Ear." In the two weeks following the meeting, Professor Bárány will give a special graduate course in modern otology, emphasizing especially the newer methods employed in his clinic. This course will be given under the auspices of the Minnesota Academy of Ophthalmology and Otolaryngology.

Dinner for Dr. Work.—Postmaster General Hubert Work, formerly President of the American Medical Association, was the guest of honor at a dinner, July 26, in Washington, D. C. The dinner was given by the chargé d'affaires of the Panama legation, Señor Lefevre, in the presidential suite at the Willard Hotel, in honor of the committee of the American Medical Association appointed to cooperate with the board of directors of the Gorgas Memorial. His guests included Dr. de Schweinitz; the Undersecretary of State, Dr. Charles W. Richardson, Washington; Dr. Lund, Boston; Dr. L. S. Rowe, director general of the Pan-American Union; Admiral W. C. Braisted, chairman of the Gorgas Memorial; Surgeon General Merritte W. Ireland; Surgeon General Hugh S. Cumming and Surgeon General E. R. Stitt.

Formation of Health Unit Planned.—Plans are being made by the International Health Board to establish and maintain, in a county in a southern state, a health unit which will not only serve as a model to show what may be done in the conservation of health, but will also serve as a training ground for members of its staff, preparatory to service in foreign subtropical fields. This health unit will not be large, nor will its budget be heavy, or its personnel numerous. It will be modeled along the same lines as those operating at present under the direction of the state board of health, but the methods of the International Health Board will be followed in the study and method of handling certain diseases common to the tropics. Dr. Smiley, the representative of the International Health Board from New York, arrived in Columbia, S. C., July 24, to investigate conditions in South Carolina in this connection. He states that the health unit will probably start work in September.

Action on Dye Embargo.—Wide publicity has been given to the editorial of THE JOURNAL urging the retention of the embargo on dyes and drugs, by the prompt action of Senator Frelinghuysen of New Jersey in printing it in the *Congressional Record* of August 12. It is believed that this editorial voices the sentiment of the medical profession throughout the country on the wisdom of protecting the American dye industry and the related synthetic drug industry which has been built up during and since the World War. Members of the Senate during the past week have been flooded with letters and telegrams demanding that the embargo on dyes and synthetic drugs be continued. As the tariff bill now stands, these provisions are eliminated by a recent vote of the Senate in the Committee of the Whole. The Senate will be called on again this week to vote on this problem a second time. If the Senate fails to retain the embargo, the prediction is made that several hundred American manufacturers of dyes and synthetic medicines must close their plants and laboratories because they will be unable to face German competition.

Bequests and Donations.—The following bequests and donations have recently been announced:

Bowdoin College, Brunswick, Maine, $500,000, under the will of Edward H. Blake of Bangor, Maine.

Madison, Wis., $500,000 for the erection of a Methodist hospital in that city, by the will of the late Justice R. D. Marshall of Madison.

To establish a children's hospital at Grand Rapids, Mich., $350,000 by Charles R. Sligh of that city.

Uniontown Hospital, Uniontown, Pa., $300,000 for a nurses' home, anonymously.

Torrance, Calif., $100,000 for a hospital, by the will of Mr. Torrance, founder of the town.

Memorial Hospital, Nashua, N. H., $40,000, and $15,000 more bequeathed in trust during the lifetime of the three heirs, by the will of Mrs. Mary J. Crowley of Roslindale, Mass. About $300 to St. Joseph's Hospital and large amounts to various hospitals around Boston.

St. Luke's Hospital, Chicago, $40,000 in memory of her husband, by Mrs. John J. Borland. This fund is to endow a fellowship for clinical investigation, and will be under the supervision of Dr. Joseph A. Capps.

Rockingham Memorial Hospital, Harrisburg, Va., $25,000 for the erection of an addition, by J. F. Reherd of Harrisburg.

Knox County General Hospital, Rockland, Maine, $20,150 in pledges.

Good Samaritan Hospital, Los Angeles, $10,000 for a new wing, by the will of James Slauson of Los Angeles.

Miami Valley Hospital, Dayton, Ohio, $10,000, and Christ Hospital, Cincinnati, $5,000, by the will of Robert Johnson.

Jarman Memorial Hospital, Tuscola, Ill., 40 acres of land valued at $10,000, by Robert C. Macy of California.

Barlow Sanatorium, Los Angeles, $5,000, by the will of Mrs. Lucia W. Jennison of Covina, in memory of her husband and son.

Cape Cod Hospital, Hyannis, Mass., $5,000, anonymously.

Hollywood Hospital Company, Hollywood, Calif., $2,000, by Mrs. Catherine Winterhalder of that city.

Philadelphia Home for Incurables, $1,000, on the death of the annuitants of the estate of Jacob E. Hynemann. This estate, disposing of $50,000, is divided into a number of small bequests to other charities, and the residue is bequeathed to the Federations of Jewish Charities.

Beth Israel Hospital, Montefiore Home, Mount Sinai Hospital and the United Hebrew Charities, New York City, $1,000, each, by the will of Hirsh Rabinowitz.

Speers Memorial Hospital, Dayton, Ky., $1,000, by the will of A. L. Andrews of that city.

Lawrence General Hospital, $2,000; Lawrence Home for Aged People, $1,000, and the Lawrence Y. W. C. A., Lawrence, Mass., $1,000, by the will of Elizabeth Slater of Lawrence.

Old Ladies Home, Salem, Mass., $3,000, and the Salem Hospital, $2,000, under the will of Frances Browne.

Children's Free Hospital, Louisville, Ky., $500; his medical library and surgical instruments to his son on condition that some of the books and instruments are presented to a colored medical school, by the will of Dr. I. N. Bloom of Louisville, Ky.

Medford, Mass., for the establishment of the Lawrence Memorial Hospital, gift of a site by Mrs. Carolyn R. Lawrence and bequests by Daniel W. Lawrence and Roswell B. Lawrence.

West Reading, Pa., a site for the new Reading Hospital, by the Wyomissing Development Company.

LATIN AMERICA

Prize to Magalhães.—The *Brazil-Medico* mentions that the Durocher prize offered by the Academia Nacional de Medicina at Rio de Janeiro was awarded to Dr. Fernando Magalhães for his work entitled "Abdominal Cesarean Section." The committee awarding the prize stated that its award did not imply that it agreed altogether with the statements of the author.

Election of Officers.—The Academia Nacional de Medicina at Rio de Janeiro recently reelected its president, Dr. Miguel Couto. Dr. Juliano Moreira was elected vice president, Dr. Belmiro Valverde, first secretary, and Dr. Artidonio Pamplona, second secretary. The editors of the *Annaes* are Dr. Ferreira da Silva, Dr. H. Autran and Dr. F. Vaz. The Alvarenga prize was not awarded.

Memorial to Odriozola.—The first anniversary of the death of Dr. E. Odriozola of the chair of clinical medicine at the University of Lima, Peru, was the occasion of the unveiling of a statue in the Hospital "Dos de Mayo," and of a tablet in the hall of the medical faculty. The *Crónica Médica* gives illustrations of both and reproduces the addresses by different speakers. The authorities ordered the name of the hospital ward to be changed to "Servicio Ernesto Odriozola." The tablet was presented by the medical students, the statue by a committee of physicians.

Prizes Offered by the Havana Academy of Sciences.—The *Revista de Medicina y Cirugía* of Havana states that the Gutiérrez prize of 400 pesos wil be awarded by the Academia de Ciencias for the best work on the medical geography of some part of Cuba. The Cañongo prize of 200 pesos is offered for the best work on any scientific subject, and the Gordon gold medal for the best work on the "Physiologic Conception of Sleep." The competing articles must be sent in anonymously, and be in the hands of the secretary before March 30, 1923. The address is Academia, Cuba 84 A, Havana.

School Medical Inspection in El Salvador.—The *Boletin Sanitario* of El Salvador contains the fifty-four paragraphs of the school medical inspection decree of 1921. It provides for medical inspection not only of the children but for the teachers and school attendants. The teachers are required to appear for examination a week before school first opens. One paragraph specifies that no member of the teaching force is allowed to enter on his or her duties without presenting to the school authorities the certificate showing that the medical inspection had been successfully passed. The school medical section of the state department of public instruction comprises a medical director, subdirector and four inspectors, a dentist and an assistant dentist. All the boards of education, local boards of public health, sanitary and vaccination inspectors, professors of physical training, and the public health officers, are all ex officio auxiliaries of the school medical section.

National Prizes for Scientific Works.—The *Semana Médica* brings the report of the awarding of the national prizes given by Argentina for scientific productions during 1920 and 1921. The first prize for 1920, a sum of 30,000 pesos, was awarded to Dr. M. R. Castex for his work "Tardy Inherited Syphilis." It was briefly mentioned in these columns recently. The second prize was not awarded, but the third prize was divided between Dr. C. Heuser, for his "Manual of Radiology," and Dr. J. W. Tobias, for his publications on the epidemic of influenza. The first prize for 1921 was divided between Dr. E. A. Boero, for his work, "The Lower Segment of the Uterus During Delivery"; Dr. G. Bosch Arana for his research and publications on "Cineplastic Amputations" (also summarized in the Current Literature Department from time to time), and Dr. P. I. Elizalde for his work "Syphilitic Disease of the Lung." The second and third prizes for 1921 were not awarded.

Personal.—The Academia de Medicina of Rio de Janeiro has elected Dr. Angel H. Roffo to honorary membership. He is professor of pathologic anatomy at the University of Buenos Aires, director of the Cancer Institute, and a member of the editorial staff of the *Prensa Médica Argentina*.——Dr. Luis Güemes was recently presented with a gold medal by the medical force of the Hospital Nacional de Clínicas, the occasion being his retirement from the chair of clinical medicine at the University of Buenos Aires. He was presented also with an album from the general profession of the country, bearing the signatures of numerous friends and pupils. He has served as senator, and is a member of the committee publishing the *Semana Médica*.——Dr. A. Hidalgo Nevarez was appointed to represent the medical faculty of the University of Guayaquil at the festivities at Quito in honor of the centennial of a decisive battle in the struggle for independence. Dr. C. V. Coello was the official representative of the Sociedad Médico-Quirúrgica and its monthly organ, the *Anales*.——Dr. J. Coronel has been elected honorary member of the medical faculty of the University of Guayaquil.——The *Revista de Medicina y Cirugia* of Havana announces that Dr. Aristides Agramonte has been appointed secretary of the national public health service, which is a cabinet office, known officially as the Secretario de Sanidad y Beneficencia, and that Dr. M. G. Lebredo has been given the post of director de Sanidad. Both are on the editorial staff of the *Revista*, and the former is professor of bacteriology in the University of Havana.

FOREIGN

Fund for Russian Physicians.—The British Medical Association, on June 14, unanimously resolved that every member be asked to contribute 5 shillings each (about $1) in answer to the appeal of the starving medical men and their families in Russia. The total sum received up to July 3 was about $3,500.

Prize to Ravenna.—The Reale Istituto Veneto di Scienze of Venice awarded at its recent annual meeting the Balli-Valier prize of 6,000 liras to Prof. Ettore Ravenna of the Veterinary School of Modena for his monograph entitled "Endocarditis in Anthrax." This prize is conferred on the Italian scientist who has done most to advance the medical sciences during the preceding two years.

Retirement of Arnozan.—Without waiting for the age limit, Professor Arnozan has resigned the chair of clinical medicine at the University of Bordeaux. His friends are organizing a manifestation in his honor in November, and a bronze replica of the tablet it is planned to present to him will be given to all who subscribe 25 francs. Dr. Creyx, 10 rue Boudet, Bordeaux, is the treasurer of the fund.

Scarcity of Rabbits for Pasteur Treatment.—The *Deutsche medizinische Wochenschrift* relates that the Pasteur Institute of the Breslau University appeals to every one who desires to be treated for the bite of a supposedly rabid animal to bring one or two rabbits. The price paid for the rabbits will be refunded. Unless this is done, there may be danger of not being able to apply the treatment properly.

Tribute to Barduzzi.—A gold medal and a number of other gifts were presented to Prof. D. Barduzzi of Siena in July at an imposing ceremony as he took leave of the chair of skin diseases and syphilis, which he held until reaching the age for retirement. The occasion was also the fiftieth anniversary of his professional career. A history of his life and school was published and presented to him by the medical students, and a parchment address with numerous subscribers.

The Warsaw University Celebrates the Padua Septicentennial.—The *Riforma Medica* describes the ceremonial gathering at the University of Warsaw in honor of the celebration of the seven hundredth anniversary of the founding of the university at Padua. There was a large official representation from the government and scientific societies, and the speakers emphasized the influence on civilization of this

early institute of learning. The famous Polish scientist Copernicus studied at Padua.

Memorial to Medical Officers.—The memorial tablet in memory of the officers and men of the Royal Army Medical Corps was unveiled at Westminister Abbey, London, July 17, by the Duke of Connaught. The tablet records the loss of 743 men and 6,130 noncommissioned officers and men. During the ceremony, the Duke of Connaught, colonel in chief of the R. A. M. C., asked the Dean of Westminster to accept a gift from the memorial fund of $50,000, as a contribution to the restoration fund of the abbey.

The Michelin Prize for a "More Babies" Pamphlet.—The French Alliance for Increasing the Population of France has offered a main prize of 50,000 francs and forty-five other prizes with a minimum of 1,000 francs each for the best works suitable to be printed and distributed as propaganda to combat the declining birth rate. The competing works must be in the hands of the Alliance before Dec 15, 1922. All must be inscribed "Prix Michelin de la Natalité" and addressed to the Alliance Nationale pour l'Accroissement de la population française, 10 rue Vivienne, Paris.

Personal.—Our German exchanges mention that Prof. O. Mayerhof of Kiel, known for research on physiology of muscle, has been invited to lecture at Cambridge on this subject.——The *Klinische Wochenschrift* states that Dr. J. Schneider of Milwaukee has been elected "honorary senator" by the University of Würzburg in recognition of his donation of 3,000,000 marks to the university on the recent anniversary of its foundation, 340 years ago. Würzburg was his alma mater.——Dr. W. Roux of Halle has been elected honorary member of the Academy of Medicine at Turin. The *Deutsche medizinische Wochenschrift* states that Professor Roux has presented to the Roux Foundation for research on the mechanics of development the 30,000 marks recently sent him by the St. Louis Emergency Relief Committee for German and Austrian Universities.——Dr. F. von Luschan, professor of anthropology at the University of Berlin, retires this year, having reached the age limit. He taught physiology at first.

Graduate Education in London.—A deputation received, July 13, by the minister of health, laid before him the present status of graduate medical education in London. The committee appointed by Dr. Addison, former minister of health, recommended that an institute or college of hygiene be established in London. This has been made possible by the munificent gift of the Rockefeller Foundation, and furthered by a promise from the minister of health of an annual grant of £25,000 for upkeep. A site has been selected and other arrangements are in progress. It was further recommended that a graduate medical school be established to serve as a center of a great teaching organization, in which the special hospitals of London, the Poor Law infirmaries and the medical schools, with their clinical units and research departments, would all find their place. It advised that, as an integral part of the organization, there should be a bureau or central office controlled by a committee of management and providing a library, a hostel and full facilities for social intercourse. Nothing has been done to advance this second recommendation, and it is on this point that the deputation made representations to the minister. The president of the Royal College of Physicians of London, the president of the Royal College of Surgeons of England and the chairman of the committee on graduate education of the British Medical Association, were among the members of the deputation.

Deaths in Other Countries

Sir **Edward Malins,** professor of midwifery at Birmingham University, England, died, July 23, aged 80.——Sir **William Bisset Berry,** at one time speaker of the Cape Colony Parliament; mayor of Queenstown, South Africa, aged 83.——Dr. **Charles Henry Brooking,** Paignton, England, July 16, aged 101.——Dr. **P. Miquel,** municipal bacteriologist at Paris and research worker in biologic chemistry, etc., aged 72.——Dr. **Ramón Torres Casanovas,** professor of surgical pathology, at the University of Barcelona and a member of the editorial staff of the *Revista Española de Medicina y Cirugía.*——Dr. **G. Scholinus,** proprietor of the private neurologic clinic at Pankow.——Dr. **C. Gangotena Chiriboga** of Quito.——Dr. **H. L. Soares da Camara** of Rio de Janeiro, formerly deputy from the state of Rio Grande do Norte.——The *Anales* of Guayaquil reports the tragic death of Dr. **A. Vásconez** of Ecuador, who has been practicing in La Plata, Argentina. He was leaving a patient at 11 p. m., and was shot by a policeman who mistook him for a burglar.

CORRECTION

Discussion on Endocrinology.—Dr. Walter B. Cannon writes that through a misunderstanding his remarks in the discussion of the symposium on endocrinology (THE JOURNAL, July 8) were not revised. The corrected discussion will appear in the transactions of the section. Dr. Cannon states "I should be glad to furnish an interpretation of them to any one who may be mystified by them." Dr. A. J. Carlson states that he neglected to include the word "not" in a sentence in his discussion. The sentence should have read: "I did not doubt Dr. Cannon's experimental facts."

Government Services

Silver Spring Training School

Silver Spring Training School is a new departure of the U. S. Veterans' Bureau in placement training, especially as it pertains to neurotic, shell shocked and nervous patients. Heretofore these men have been put directly into training in some shop or educational institution where they had to compete with normal men. In a large majority of cases, they have fallen down, not physically but mentally, thereby causing a great loss of time in eventual rehabilitation, and complete loss of money to the government. The class of men received there comprises the various grades of shell shock cases, neurasthenics, psychoneurotics, cases of mental inferiority without psychosis, and of hysteria and traumatic neurosis. These men have all been hospitalized for periods of from one to three years, and have attained the maximal benefit procurable by such means. Some of them have been in various types of training and have broken down physically and mentally. For such cases, Silver Spring is a last resource. For those who have not been in training, it is a try-out station where a man can be fitted into his right niche under competent supervision. All kinds of athletics are encouraged and made obligatory as much as possible by the medical department.

Change in Hospitalization Plans

Col. Charles R. Forbes, director of the U. S. Veterans' Bureau, has announced a new policy of hospitalization of disabled World War veterans which consists of changing many hospitals into training centers. The policy was based on conclusions reached after Colonel Forbes had made an inspection of nearly all the veterans' hospitals in the country, and he states that what the tuberculous and mental patients needed was some other kind of institution. About 65 per cent. of the tuberculous hospital inmates, it was learned, were walking patients who, together with the mental cases, would be better off elsewhere than in the atmosphere of a hospital. Colonel Forbes declared, in changing the bureau's policy, that he intended to take up the question of turning some of the present hospitals into training centers. In discussing the matter he said:

> Of course, there are many important angles to this problem, all of which are being worked out carefully by this office and the medical division of the bureau. Some of our hospitals can be converted into combination sanatoriums and training centers, where the men who have progressed physically to the working and planning stage will be given as much to do in their chosen vocational work as competent officials find they are able to without danger of a relapse. This will result in a better and a more contented mental state at once, and as the men improve their vocational work will be steadily increased. In many individual instances it will be possible, we hope, to permit student-patients of this sort to go to their homes, subject to reasonable regulations. For them we shall devise a simple inspection system as to their physical condition and to be assured that this latitude in their behalf is not abused. In all such instances the men will be allowed to go home for the final stages of their complete recovery and vocational training only after competent medical officers have found them near enough to good health to justify the step. We expect to keep these student-patients on the same pay status as they are at present. Our only object is to get the veterans away from the conventional hospital as soon as possible. There is no use restoring a man's body if he has to stay in a morbid atmosphere so long that his morale sinks to the point at which he is afraid to take the plunge again into civil life. Physicians and scientists agree that a system which revives physical functions at the expense of economic usefulness has betrayed its trust. The conception of a hospital's function as mere physical restoration is narrow, sectarian and obsolete. We believe that this plan, when fully worked out, which is being done speedily, is applicable not only in mental and tuberculous cases which have progressed sufficiently to benefit by it, but also to thousands of chronic general cases. The plan is designed to fit into a larger policy of applying long needed minimum standards in all hospitals.

Foreign Letters

LONDON

(From Our Regular Correspondent)

July 27, 1922.

British Congress of Obstetrics and Gynecology: Treatment of Eclampsia

The third British Congress of Obstetrics and Gynecology has been held at Liverpool under the presidency of Mr. Harold Clifford (Manchester). Except for an exhibition of pathologic specimens, the congress was devoted to a symposium on the treatment of eclampsia, in which the leading obstetricians of the day took part. Dr. T. W. Eden presented a report dealing with all cases of eclampsia admitted during the decade 1911-1921 at fifteen London hospitals. Only cases in which convulsions occurred are included, and cases of chronic renal disease complicated by uremic convulsions are, as far as possible, excluded. The patients numbered 547, of whom 427 recovered, the mortality being 22.1 per cent. As eclampsia varies greatly in severity in different cases, the comparison of different forms of treatment requires some grouping of cases; for if a treatment has been adopted only in mild cases, and another only in severe cases, the results in the two groups are not comparable. With this object, the effects on prognosis of coma, pulse rate, temperature, number of convulsions, amount of albumin in the urine, degree of edema, and blood pressure have been examined.

The symptoms showed that the phenomena to be regarded as danger signals are coma, a pulse over 120, a temperature above 103 F., convulsions numbering more than ten, a urine which solidifies on boiling, the absence of edema, and a blood pressure above 200 mm. When a patient exhibited only two of the foregoing symptoms, the case was classed as severe; when these phenomena were absent, as mild. Excluding fourteen moribund cases, there was a total of 425 cases, with a mean mortality of 16.2 per cent. If the cases are divided into mild and severe, the figures are: mild: number, 264; mortality, 6.4 per cent.; severe: number, 161; mortality, 32.4 per cent. The ratio of the mortality rate in mild and severe cases, therefore, is 1 : 5.

In regard to treatment, the cases were divided into five groups: 1. Natural delivery: total, eighty-nine; mean mortality, 12.3 per cent.; mild, fifty; mortality, 6 per cent.; severe, thirty-nine; mortality, 20.5 per cent. 2. Induction of labor, delivery thereafter being spontaneous: total, eighty-three; mean mortality, 9.6 per cent.; mild, fifty-nine; mortality, 5.1 per cent.; severe, twenty-four; mortality, 20.8 per cent. 3. Assisted delivery, mostly low forceps, with a small number of versions: total, 151, of which twenty-two patients died; mean mortality, 14.5 per cent.; mild, 100; mortality, 5 per cent.; severe, fifty-one; mortality, 33.3 per cent. 4. Cesarean section: vaginal operations, six; five patients recovered and one died; total, eighty-eight, of whom twenty-one died; mean mortality, 23.8 per cent.; mild, fifty-one; mortality, 9.8 per cent.; severe, thirty-seven; mortality, 43.2 per cent. 5. Accouchement forcé (nearly all forcible manual dilatation of the cervix): total, fourteen, of whom seven died; mean mortality, 50 per cent.; mild, four; mortality, 25 per cent.; severe, ten; mortality, 60 per cent.

If the mild cases in which delivery was made by the three simpler methods (1 to 3) are put together and compared with the severe cases in which delivery was made by the same methods, the mortality rates are 5.2 and 26.3 per cent., respectively; that is, the ratio of 1:5 is almost exactly maintained. Comparing, in the same manner, the cesarean sections, the mild cases showed a mortality of 9.8 per cent., the severe 43.2 per cent., which also corresponds closely to the mean ratio of 1:5. The cases in which delivery was made by accouchement forcé are excluded, because the results condemn this method under any circumstances. Hence, it appears that cases which can be classified as severe show a mortality rate five times that of those classified as mild, no matter what method of delivery is adopted. It is also clear that the cases in which there was no obstetric interference, or in which only simple methods were adopted, show a much lower mortality than those in which delivery was made by cesarean section. Three conclusions are drawn: (*a*) Natural delivery or delivery by simple methods is attended by the smaller risk; (*b*) rapid and forcible dilatation of the cervix is attended with danger; (*c*) cesarean section impairs the chances of recovery, whether the case is mild or severe. An attempt was made to assess the value of the various methods of medical treatment, but no definite conclusion could be drawn, as the treatment in the large majority of cases ranged over several methods. However, the conclusion was drawn that the majority of the fatal cases were overtreated, and that in a considerable number the excessive treatment must have been a contributory factor in the fatal results. It is proposed to test comprehensively at the London hospitals one or more simple schemes of treatment.

THE DUBLIN METHOD

A paper which excited great interest and favorable comment was read by Dr. Bethel Solomons on the Dublin method. The main points are: 1. Starvation, everything except water being excluded. The food ingested and the toxic elements from the fetus require the same ferments in the blood to neutralize them; the fetal toxin takes some of the elements from the blood intended for the digestion of food, which leaves the latter with no ferment, and therefore the food acts as a toxin. The starvation should be continued for three days, after which, if there is no improvement, cesarean section or induction should be recommended. 2. Stomach lavage. 3. Bowel lavage. These are most important. 4. Morphin. The value of this drug is at present *sub judice*. 5. Injection of sodium bicarbonate solution under the breasts in all but the mildest cases. 6. Close observation of the patient, which will avoid many deaths from drowning by mucus. Nothing must be given by mouth to the unconscious patient. The fewer the convulsions, the greater the chance of recovery; therefore, convulsions must be controlled. The treatment controls the convulsions and allows time for the natural efforts of the body to split the toxins into some simpler product and thus render it innocuous. With regard to mortality, in Dr. Tweedy's mastership of the Rotunda Hospital the intern mortality rate was 8.82 per cent. in sixty-eight cases; while, if the extern results were included, the rate fell to 8 per cent. There were no deaths in the last twenty-nine cases, showing the better results following improved technic.

Third International Congress of the History of Medicine

At the Third International Congress of the History of Medicine, held in London, the countries represented were Belgium, Czechoslovakia, Denmark, Egypt, France, Greece, Holland, Italy, Portugal, Roumania, Spain, Switzerland and the United States. Lord Onslow, parliamentary secretary to the ministry of health, welcomed the delegates on behalf of the government. The president, Dr. Charles Singer, lecturer on the history of medicine, London University, said that the history of medicine, like other evolutionary studies, gave an interest and a meaning to present phenomena that could be obtained through no other channel. Some still thought that medical history was best left to the spare time of professional medical men who had the leisure and literar

gifts for its pursuit. The work of such men had been one of the greatest glories of British learning. In the past, British achievements in the department of the history of medicine had been wholly their work. The most eminent exponents of the subject in this country were men who had given to its study the time they could spare from the practice of their profession. He mentioned their president of honor, Sir Norman Moore, and Sir Clifford Allbutt, as two veterans in the study of medical history. They were prevented by advancing years from being present; but in their place they had two men who were active exponents of the subject, who by their skill, learning, integrity and kindliness had earned the affection and respect of the entire English-speaking medical profession—he referred to the vice president of honor, Sir D'Arcy Power, and to the treasurer, Dr. W. G. Spencer. He coupled with their names that of Dr. Raymond Crawford. The fact that England had produced such men and many others of the same type proved that first-class historical work could be produced in the intervals of a busy professional life. Their work demonstrated the humane and educational value of the history of medicine. Once the topic entered the curriculum, the need for special teachers became apparent. That need had begun to be recognized and to be met in this country, and it was his hope that before this congress assembled again it would be more adequately and more widely met throughout the civilized world. The history of medicine was not only a subject to attract and amuse but also a discipline, full of humanity and philosophy, covering more than half of the field of studies known under the name of the history of science. The thoughts of our century were separated from those of the past by the fertilizing doctrine of evolution, and it had helped to stimulate the historian's studies in biologistic research. The history of medicine gave to the physician in practicing his profession or in carrying out researches the only footing to withstand the cynicism of the period of life when the ardor of youth had disappeared without being replaced by the mellowness of age.

BERLIN

(From Our Regular Correspondent)

July 22, 1922.

Germany's New Law Pertaining to Juvenile Welfare

Section 1 of the law pertaining to juvenile welfare states that every German child is entitled to receive such an education as will render him (or her) physically, mentally and socially fit. The rights and duties of the parents with respect to the education of their children are not affected by this law. Against the will of the parents or guardian, intervention is admissible only when the law specifically allows it. Public assistance to juveniles is not given unless a child's right to an education is not being fulfilled by the family. The juvenile welfare societies *(Jugendämter)* are the organs through which public assistance to juveniles will be given, except under certain conditions in which other authorities are compelled to intervene. The duties of the *Jugendämter* are to protect foster-children, to assist in matters pertaining to guardianship, to care for needy minors, to assist by way of supervision of delinquents and in the education of neglected children, to aid in juvenile court matters, to cooperate in the supervision of child labor and the employment of juveniles, to help in providing for war orphans and the children of the war injured, and to render aid to the police authorities in the matter of juvenile welfare in general. Still further duties of the *Jugendämter* are: to provide opportunities for holding councils in matters pertaining to juveniles, protection of mothers before and after childbirth, infant welfare, welfare of children under school age, welfare of children of school age during the hours out of school, and the welfare of juveniles who have left school. The *Landesjugendämter* (provincial *Jugendämter*) are the central offices in each state or province, which exercise a general control over the *Jugendämter* in the various municipalities and endeavor to establish a uniform policy and see that it is carried out. A council on juvenile welfare has also been added to the office of the minister of the interior. It is the duty of the *Reichsjugendamt* (central *Jugendamt* of the empire) to collect information pertaining to welfare work in general and to communicate such information to the *Landesämter*, and to provide in other ways for the dissemination of information on the subject of child and juvenile welfare.

The Effect Colors Exert on the Mind

The Deutsche Gesellschaft für Licht- und Farbenforschung of Munich has published for schools, sanatoriums, hospitals, etc., a series of charts with which to teach by the object method what has been ascertained in regard to the hygiene of colors. In order to understand the psychology of colors and to make proper use of them in interior and exterior decoration it is necessary to become familiar with the effects that they exert on the mind, and more particularly, the emotions. White makes a room larger and lighter, but it appears cold and empty. A crimson hue imparts an air of delicacy. Children in a room with crimson-tinted walls and light that passes through crimson shades work eagerly and more than usual. Yellow makes a room appear to be flooded with light, gives the feeling of sun warmth and produces a sense of comfort. Otherwise dingy rooms are enlivened and made more cheerful by yellow wallpaper. Orange exerts the most marked warmth giving effect and disposes to cheerfulness. Orange colored curtains in a bedroom produce a tinting effect that has a stimulative influence on the nerves. Red is the color that best represents spontaneous youthful joy, but it is the hardest on the eyes. A pure neutral red causes unrest; persons inclined to melancholy are put in a livelier frame of mind, but persons who are nervous should avoid red. Violet exerts a depressing effect. Blue has a calming and soothing effect. Patients will sleep better with a night-lamp, if provided with a blue shade, than they will in the dark. Green has a calming influence. Gray, if it covers a wide area, is barren and dreary. Persons become depressed in such dingy rooms and give evidence of lack of interest in their work. Especially patients are likely to be thrown into an unhappy frame of mind by dark and somber surroundings. Even though these conclusions may not be universally true, they at least deserve attention in the furnishing of our homes, and especially of hospital wards.

PARIS

(From Our Regular Correspondent)

July 28, 1922.

Second Congress of the Association of French-Speaking Pediatricians

The second congress of the Association des pédiatres de langue française, which was originally supposed to meet in Lyons in 1914 but which was postponed on account of the war, was held in Paris, July 10-12, under the presidency of Dr. Edmond Weill, professor of clinical pediatrics of the Faculté de médecine at Lyons. Among the subjects on the program, three deserve particular attention: (1) diabetes mellitus in children; (2) congenital scoliosis, and (3) rôle of the pituitary and the pineal bodies in infantile dystrophy.

DIABETES MELLITUS IN CHILDREN

Dr. Paul Rohmer of Strasbourg stated that, clinically, infantile diabetes falls into three divisions: prediabetic states; mild diabetes, which is probably identical with renal diabetes, and "habitual" diabetes, which is almost always a

grave type. Prediabetic states in children have not as yet been the object of systematic research. One incentive to study them lies in the fact that the familial character of the disease is found more frequently in children than in adults. It has long been known that children of a lymphatic temperament very commonly present sugar in the urine (Comby, Terrien).

A second form of glycosuria that merits the particular attention of pediatricians is a type which, owing to its usual benign evolution, detracts from the grave character of habitual infantile diabetes and presents cases that are called "diabètes innocents" (Salomon) and that betrays certain points of resemblance with renal diabetes. As for habitual diabetes in children, it progresses more or less rapidly, with a regularity which might be termed monotonous, nearly always toward a fatal outcome. As regards etiology, syphilis may well be suspected. Another factor that is frequently noted in connection with observations on infantile diabetes is its hereditary, or more particularly, its familial character. What it is that makes infantile diabetes particularly grave is not known. Some have attempted to explain the frequency of acidosis by assuming relatively small stores of alkaline salts in the body of the patient. Others, again, have pointed to a possible increase in cellular metabolism in the child, calling to mind the fact that, under similar conditions in hyperthyroidism, disturbances of the sugar regulatory center are likewise noted.

As for treatment, restriction of diet, in general, has become the fundamental principle of modern management of diabetes —at least, of grave diabetes, and every case of infantile diabetes should be regarded as grave diabetes, even though it may present a benign aspect. Lowering the protein intake to the limit of what is compatible with the needs of the organism is fully as important, sometimes even more essential, than the restriction of carbohydrates. Dr. Lereboullet of Paris emphasized particularly the importance of prediabetic states and the need of examining the brothers and sisters of diabetic children, in order to discover the first signs of diabetes that might develop later in a frank form. While he recognized the importance of the conception of renal diabetes, he stated there was need of care lest too absolute conclusions should be drawn. Two of his patients who presented symptoms of renal diabetes, including notably the absence of pathologic glycemia, had, nevertheless, severe attacks of acetonemia. Lereboullet likewise pointed out the absence of hereditary syphilis in a large number of cases observed by him and stated that the application of antisyphilitic treatment in such cases was of little avail. However, he recognizes the importance of the rôle, at least from the provocative standpoint, of accidental acute infections, and reported a case in which influenza appeared to be the point of departure.

Dr. P. Nobécourt, professor of clinical pediatrics of the Faculté de médecine in Paris, warned against instituting a too strict carbohydrate diet. Lereboullet also pointed to the same danger.

Congenital Scoliosis

Drs. Mouchet and Carle Roederer, of Paris, stated that scoliosis without bone anomalies presents, as a rule, a favorable prognosis. It is, to be sure, less frequent than scoliosis with vertebral anomalies. Among cases of the latter, scoliosis with a semivertebra (*hémivertèbre*) is the most common. These semivertebrae may constitute a supernumerary addition to the spine or they may take the place of normal vertebrae. The supernumerary semivertebra is situated more commonly at the left in the lumbar region, it being found especially frequently between the first and second vertebrae. Hemiatrophy of a normal vertebra occurs most frequently in the superior dorsal region. There are frequent remote concomitant anomalies, such as clubfoot, congenital luxation of the hip joint, imperforate anus or other conditions affecting the spinal column or the vertebrae (absence, excessive number, ankylosis). Scoliosis with a semivertebra may be noted at birth or when the child first begins to walk. It is characterized by a more or less rigid deflection, together with gibbosity. Palpation will locate, along the line of the spinous processes, in the convex groove, the side of the semivertebra, protruding at times like a second spinous process. This scoliosis results from bad sitting and walking postures, so that, when a child is 3 years old, the compensations are already accentuated. Restoration of normal equilibrium is usually comparatively easy.

In the type of scoliosis with tardy manifestation are found lateral curvatures associated with anomalies in the form of supernumerary vertebrae or, more especially, missing vertebrae, in which the cervical region is the part most frequently affected. Scoliosis resulting from true ankylosis concerns more particularly the atlas, which is united with the occipital bone only at one edge. Synostosis may also be noted between the atlas and the axis or between the axis and the third cervical vertebra. Scoliosis may be associated also with rare cases of anterior spina bifida or, more commonly, with the posterior type, which is especially frequent in the lumbosacral region. This last type is also found combined with anomalies of the fifth lumbar vertebra, which is so frequently abnormal that we scarcely know what the normal form is. As a rule, scoliosis associated with slight malformations of the fifth lumbar vertebra is one of the tardiest types in its development. The compensation is often very great.

In arriving at a diagnosis, two main questions are to be considered: What evidence is there for congenital scoliosis? With which type of scoliosis are we dealing? In early infancy, scoliosis may easily be confused with Pott's disease or rachitic deformity. There are certain differential signs which point rather to scoliosis with a semivertebra, such as shortness of the primary dorsolumbar curve or its high location in the upper dorsal region, together with an elevated position of the scapula. But we must rely on roentgenography to give the final diagnostic decision in the presence of vertebral anomalies.

The results of treatment depend to a great extent on how early it is begun. The prognosis of scoliosis with a semivertebra, in particular, is perhaps not so grave as was formerly supposed; in the first place, because the curvature is abrupt, and secondly, because it has occurred at the expense of only one vertebra, and third, because, being situated at the level of the upper lumbar region, a compensation curvature may develop below and another above. Diagnosis of these compensation curvatures will give the essential indications for orthopedic treatment. Very young children will be placed in a plaster trough that will bring about overcorrection. Later, a celluloid jacket is substituted for the trough and manual corrections are begun as soon as possible. A little later still, an attempt will be made, by means of proper exercises and the use of traction and compression maneuvers, to correct lateral deflections and to strengthen the muscles, in order that their action may preserve the corrected positions. As for surgical treatment, attempts have been made to consolidate the fifth transverse process with the sacrum, and in one case a bony graft was used. It is possible that a fixed bony graft, following the technic of Albee, would be an operative procedure that might be useful in a few carefully selected cases. Nové-Josserand of Lyons, Comby of Paris and Haverschmidt of Utrecht emphasized the part that heredity plays in the production of scoliosis, and especially of the mild type affecting the dorsal region in the second period of childhood, which physicians are most frequently called on to treat.

Marriages

SHIRLEY CARLTON LYONS, Rochester, Minn., to Miss Marion Brown of New Orleans, at Rochester, June 30.

WILLIAMSON HALEY ROGERS, Wilson, Okla., to Miss Juanita Tidmore, of Abilene, Texas, June 19.

JOHN KEELY, Miami, Fla., to Miss May Bodine Walker of Louisville, Ga., at New York City in July.

RICHARD ELSEPH ANDERSON, Willmar, Minn., to Miss Carolina M. Schwartz of Chicago, June 24.

WILLIAM JOSEPH FRAWLEY, Appleton, Wis., to Miss Ruth Lefebvre of Chilton, Wis., June 10.

LAWRENCE JOSEPH LEONARD to Miss Vera May Buckholz, both of Minneapolis, June 29.

GROVER C. DANIEL, Fallsburg, Ky., to Miss Elma L. Gahler of Rochester, Minn., July 11.

DELIZON ARTHUR FOOTE, Omaha, to Miss Lulu N. Mazwell of Fremont, Neb., recently.

ERNEST LIGHTFOOT STRADER to Miss Blanche Lizee, both of Cannon Falls, June 28.

GERALD L. HIGGINS to Miss Pauline E. Schenck, both of Jersey City, N. J., July 7.

OTTO THEODORE GUNTHER to Miss Norma Prange, both of Sheboygan, Wis., June 17.

EDWARD B. FELTER, Plymouth, Wis., to Miss Marie Buuch of Milwaukee, June 15.

LEROY CRUMMER to Mrs. Myrtle Kelley, both of Omaha, in July.

Deaths

Henry P. Geib, Stamford, Conn.; Bellevue Hospital Medical College, New York, 1869; veteran of the Civil War; surgeon general of the state under Governor Harrison; representative in the Connecticut legislature, 1883; formerly president of the Fairfield County Medical Society, and at one time vice president of the Connecticut State Medical Society; formerly on the staff of St. John's Hospital; recently surgeon on a United Fruit Company ship; was found dead in his room, August 5, from accidental asphyxiation, aged 74.

Lyman L. Uhls ✱ Overland Park, Kansas; Rush Medical College, Chicago, 1884; for fourteen years superintendent of the Osawatomie State Hospital for the Insane; head of the Uhls Sanatorium, Overland Park; was elected a member of the state legislature in 1918 and in 1920; professor of psychiatry at the University of Kansas School of Medicine; member of the American Medico-Psychological Association; died, August 4, aged 65, at the Research Hospital, Kansas City, Mo.

William Shelley Hutton ✱ Fornfelt, Mo.; University of Nashville Medical Department, Nashville, Tenn., 1900; formerly secretary of the Southeast Missouri Medical Society; at one time physician to State Hospital No. 4 for the Insane, Farmington; aged 43; was drowned, July 3, in the Mississippi River at Gray's Point, with his 16 year old son, when trying to save him from drowning.

John Joseph MacKenzie, Toronto, Ont., Canada; University of Toronto, Faculty of Medicine, 1899; professor of pathology and bacteriology at his alma mater; served with the Canadian Army Medical Corps in Saloniki during the World War; member of the American Association of Pathology and Bacteriology; died, August 1, aged 57, from acute ulcerative endocarditis.

James Bailey Rogers, Cincinnati; Vanderbilt University Medical Department, Nashville, Tenn., 1910; formerly bacteriologist at the Edward Sanatorium, Naperville, Ill.; served as pathologist and instructor of bacteriology at the University of Cincinnati Medical College, from 1918-1921; died, July 15, aged 36, from tuberculosis, at the Edward Sanatorium, Naperville.

George Y. McCracken ✱ Philadelphia; University of Pennsylvania, Philadelphia, 1876; formerly on the staffs of the Wills Eye and Ear and St. Mary's Hospitals; member of the Medico-Legal Society of Philadelphia; died, July 26, aged 67, from cerebral hemorrhage, in Yellowstone National Park, while on his vacation.

✱ Indicates "Fellow" of the American Medical Association.

Alexander Joseph Rooney, Wrington, Somerset, England; Bellevue Hospital Medical College, New York City, 1867; member of the Medical Society of the State of New York; formerly a practicing physician in Brooklyn; for many years a police surgeon, health inspector, and coroner of Brooklyn; removed to England in 1917; died, July 31, aged 83.

William Davis Granger, Tuckahoe, N. Y.; New York University Medical College, New York City, 1879; member of the Medical Society of the State of New York; member of the New York Neurological Society and the American Medico-Psychological Association; died, July 30, aged 75, at Squirrel Island, Maine.

Louis Dominick Robinson, Montgomery, Ala.; Tulane University of Louisiana School of Medicine, New Orleans, 1896; member of the Medical Association of the State of Alabama; died, July 30, aged 48, at the Washington County Hospital, Hagerstown, Md., following an operation.

Emma Lucas Johnston, Los Angeles; Women's Medical College of Pennsylvania, Philadelphia, 1892; formerly health officer of Peoria, Ill.; at one time served as resident physician at the State Asylum, Pueblo, Colo.; died, July 28, aged 68, from brain lesion complicating arteriosclerosis.

Joseph G. Ellis, Denison, Texas; Hospital College of Medicine, Medical Department Central University of Kentucky, Louisville, 1879; member of the State Medical Association of Texas; member of the school board; at one time served the city as alderman; died, July 29, aged 73.

Joseph J. Duncan, Jr. ✱ Pittsburgh; Western Pennsylvania Medical College, Pittsbugh, 1895; ophthalmologist; formerly surgeon to the Eye, Ear and Throat Hospital, Pittsburgh; member of the American Ophthalmological Society; died, July 27, aged 50, at the Presbyterian Hospital.

Frederick Augustus Davis, Boston; Hahnemann Medical College and Hospital of Philadelphia, 1884; member and at one time president of the Massachusetts Surgical and Gynecological Society; for four years lecturer at Boston University School of Medicine; died, July 29, aged 61.

Philip Taylor, Richmond, Va.; Columbia University College of Physicians and Surgeons, New York, 1876; at one time served on the staff of the Royal Eye Hospital, Manchester, England; member of the Medical Society of Virginia; died, August 1, aged 72.

Bascom James Vance ✱ Checotah, Okla.; University of Nashville Medical Department, Nashville, Tenn., 1890; at one time president of the Oklahoma State Medical Association; specialized in obstetrics; died, July 27, aged 69, in a hospital at Muskogee, from pneumonia.

Jacob S. Shoff, Chattanooga, Tenn.; Medical College of Ohio, Cincinnati, 1881; Bellevue Hospital Medical College, New York City, 1882; professor of materia medica and therapy at the Chattanooga Medical College; died, recently in New York City, aged 66.

Rice Houston Lindaman, Littlestown, Pa.; Hahnemann Medical College and Hospital of Philadelphia, 1904; member of the Medical Society of the State of Pennsylvania; died, July 26, aged 41, at the West Side Sanatorium, York, Pa., following an appendectomy.

John Francis Hardman, Greenwich, Conn.; New York University Medical College, New York City, 1895; superintendent of the Blythewood Sanatorium, Greenwich; died, June 30, aged 55, from cerebral hemorrhage, at the Davenport Hotel, Stamford.

Albert William Colwill, Boston; Tufts College Medical School, Boston, 1912; instructor in pharmacology and biochemistry at his alma mater; died suddenly, July 17, aged 38, in a motion picture theater at Back Bay, from heart disease.

Robert Linn Allison, Eau Claire, Pa.; Medical College of Indiana, Indianapolis, 1896; member of the Medical Society of the State of Pennsylvania; at one time member of the local school board; died, July 26, from cerebral hemorrhage, aged 58.

George Munroe Palmer, Boston; Medical School of Harvard University, Boston, 1892; also a chemist; member of the Massachusetts Medical Society; was found dead, July 21, in Floating Bridge Pond with his jugular vein severed, aged 58.

William Albert Cundy, Pasadena, Calif.; Gross Medical College, Denver, Colo., 1896; at one time was mayor of Aurora, Colo.; died, July 25, aged 62, from injuries received in a motor accident.

Samuel Alden Conklin, Canton, Ohio; Western Reserve University School of Medicine, Cleveland, 1869; practitioner in Canton for more than half a century; formerly member of the state board of health; died, July 18, aged 81.

John H. Miller ✠ Pawtucket, R. I.; Maryland Medical College, Baltimore, 1907; former health officer of Lincoln; member of the staff of St. Joseph's Hospital, Providence, where he died, August 3, from heart disease, aged 45.

Annie Smith Campbell, New York City; New York Medical College and Hospital for Women, 1882; formerly professor of anatomy at her alma mater; died, July 11, from carcinomatosis of the abdomen, aged 60.

Miles J. Walker, York, S. C.; Louisville (Ky.) Medical College, 1879; member of the South Carolina Medical Association; member of the state board of health; died, July 11, aged 65, at a hospital in Richmond.

George Edgar Lothrop, Brookline, Mass.; Dartmouth Medical School, Hanover, N. H., 1871; proprietor of several Boston theaters; died, August 3, aged 70, at the Massachusetts General Hospital, Boston.

Ralph Emerson Stocker, Brimley, Mich; Detroit College of Medicine, 1907; Indian Service, Bay Mills School; member of the Michigan State Medical Society; died, July 23, aged 40, from diabetes mellitus.

Daniel A. Haney, Newnan, Ga.; Atlanta College of Physicians and Surgeons, 1910; member of the Medical Association of Georgia; died suddenly, July 25, aged 40, at Franklin, N. C., from chronic nephritis.

John M. Duff, Madison, S. D.; University of Buffalo (N. Y.) Department of Medicine, 1870; health officer of Lake County; died, July 7, aged 78, from arteriosclerosis and cerebral hemorrhage.

Robert Thomas Porter, Walkerton, Ont., Canada; University of Michigan, Ann Arbor, 1866; Victoria University Medical Department, Victoria, Ont., 1867; died, June 27, at the General Hospital.

Samuel Henry Hill, Carrollton, Ala.; University of Louisville Medical Department, Louisville, Ky., 1870; member of the Kentucky State Medical Association; died recently, aged 75, from appendicitis.

William John Stevenson, Georgetown, Conn.; Royal College of Surgeons, School of Surgery, Dublin, Ireland, 1874; died, July 17, aged 71, at the Danbury Hospital, from heart disease.

Burt P. Hoyer, Buffalo; University of Buffalo, 1882; member of the Medical Society of the State of New York; formerly medical examiner for Erie County; died, August 3, aged 64.

Stacy M. Wilson, Bridgeton, N. J.; University of Pennsylvania, Philadelphia, 1869; member of the Medical Society of New Jersey; veteran of the Civil War; died, July 28, aged 72.

Arthur R. Sholars, Orange, Texas; Tulane University of Louisiana School of Medicine, New Orleans, 1900; member of the Louisiana State Medical Society; died, June 15, aged 47.

George Henry Talbot, Newton, Mass.; Boston University School of Medicine, Boston, 1882; visiting physician at the Newton Hospital; died, July 28, aged 62, following a long illness.

John Small Dyer, Winter Harbor, Me.; Medical School of Maine, Portland, 1904; member of the Maine Medical Association; died suddenly, July 9, aged 52, from angina pectoris.

J. F. Lawshe, Swayzee, Ind.; Kentucky School of Medicine, Louisville, 1881; for thirteen years postmaster of Swayzee; died suddenly, July 26, aged 63, from heart disease.

William Jerome Bazemore, Chattanooga, Tenn.; University of Louisville Medical Department, Louisville, Ky., 1872; veteran of the Civil War; died, July 31, aged 78.

Prier J. Hermon, Raymond, Ill.; Rush Medical College, Chicago, 1863; died, July 24, aged 88, from injuries received when he fell off the porch two weeks previously.

John Willard Crossan, Centerville, Del.; University of Pennsylvania, Philadelphia, 1894; member of the Delaware State Medical Society; died, June 27, aged 49.

George Washington Barrett ✠ Denver; Tufts College Medical School, Boston, 1903; died, July 27, aged 51, at St. Luke's Hospital, from pleuropneumonia.

Edna May Jeffries Trewin ✠ Buchanan, Mich.; University of Michigan, Ann Arbor, 1912; died suddenly, July 28, aged 54, from cerebral hemorrhage.

T. Ninomiya, Kohala, Hawaii; Taisei Medical School, Tokyo, Japan, 1899; died recently in Hiloshima, Japan, aged 50, from chronic nephritis.

Elam S. Gibbs, Monticello, Minn.; University of Wooster Medical Department, Cleveland, 1869; died recently, aged 75, from cerebral hemorrhage.

Petros Constantinides, Toronto, Canada; Toronto School of Medicine, 1865; M.R.C.S., England, 1889; died, June 10, aged 78, from senility.

Benjamin L. Kershner, Dalmatia, Pa.; Jefferson Medical College of Philadelphia, 1871; died, August 3, aged 72, from cerebral hemorrhage.

Charles Alfred Smith ✠ Osceola, Mo.; St. Louis College of Physicians and Surgeons, 1899; died, June 8, aged 48, from cerebral hemorrhage.

William Giles Martin, Topeka, Kan.; Rush Medical College, Chicago, 1888; died recently, aged 69, at Ottawa, Kan., from angina pectoris.

Jacob J. Goodman, New York; New York University Medical College, New York City, 1875; died, August 2, aged 69, from thrombosis.

Thomas M. Hartsfield, Hillsboro, Texas; Memphis (Tenn.) Hospital Medical College, 1901; died, July 3, aged 52, in a sanatorium at Waco.

Joseph M. Powers, Warrensburg, Mo.; Eclectic Medical College, Cincinnati, 1875; died recently, aged 73, from chronic interstitial nephritis.

Nathan J. Paddock, Syracuse, N. Y.; New York University Medical College, 1879; died suddenly, July 25, aged 71, from heart disease.

William George Kanter, Detroit; Detroit College of Medicine and Surgery, 1906; for several years city physician; died, July 18, aged 36.

Louis W. Ehrlich, St. Louis; Marion-Sims College of Medicine, St. Louis, 1892; died, June 18, aged 57, from hydronephrosis.

T. A. Brady, Cuba, Ky.; Memphis Hospital Medical College, Memphis, Tenn., 1893; died, July 22, aged 78, from heart disease.

Eugene S. Huntress, Farmington, N. H. (licensed, New Hampshire, 1897); died recently, aged 62, from chronic nephritis.

Joseph Mathias Walborn, Gratz, Pa.; Hahnemann Medical College and Hospital of Philadelphia, 1887; died, July 29, aged 61.

John I. Lane, Brooklet, Ga.; Louisville Medical College, Louisville, Ky., 1870; mayor of Brooklet; died, July 10, aged 73.

James W. McClure, Sedalia, Mo.; St. Louis Medical College, St. Louis, 1867; also a druggist; died, July 25, aged 79.

Henry Shipman Jewett, Brooklyn; New York University Medical College, 1886 died, August 4, aged 86, from senility.

Alonzo J. Edson, Rockford, Ill.; Eclectic College of Medicine and Surgery, Cincinnati, 1857; died, June 5, aged 95.

William H. Bailey, Cabot, Ark. (licensed, Arkansas, 1903); died, July 23, aged 51, following a long illness.

George B. Smith, Omaha; Indiana Medical College, Indianapolis, 1872; died, July 14, aged 80, from senility.

William Hurd Fisher ✠ Buffalo; University of Buffalo Department of Medicine, 1919; died, July 17, aged 25.

Abner H. Boyd, Winchester, Kan.; Louisville Medical College, 1884; died, June 23, aged 62, from heart disease.

Arlington Stephenson ✠ Ottawa, Ohio; Cincinnati College of Medicine and Surgery, 1878; died, July 17, aged 71.

Hugh Thurman, Fayetteville, Ark.; Gate City Medical College, Texarkana, Texas, 1902; died, July 20, aged 43.

David S. Kinsey, Muncie, Ind. (licensed years of practice, Indiana, 1897); died, July 27, aged 77, from paresis.

William Arthur Lester, Onalaska, Wis.; Rush Medical College, Chicago, 1881; died, May 17, aged 66.

John A. Mason, Chattanooga, Tenn.; University of Michigan, Ann Arbor, 1905; died, recently, aged 45.

John Frank Benham, Mooresville, Ind.; Medical College of Ohio, Cincinnati, 1890; died recently.

William M. Solomon, North Little Rock, Ark. (licensed, Arkansas, 1903); died, July 30, aged 50.

James M. Nix, Adona, Ark. (licensed, Arkansas, 1903); died, June 30, aged 67, from paresis.

Correspondence

DIAGNOSTIC SURVEYS AND ASYLUM REFORM

To the Editor: — Probably no subject appeals to general practitioners more than does the care of epileptics, insane and associated classes. Estimates based on the findings of the National Committee on Mental Hygiene indicate that there are approximately 400,000 such cases under institutional treatment in the United States today. No section of the country is immune. The general practitioner is the attendant in the first instance, and remains the family adviser not only of institutionalized cases but also of the probably quarter of a million other cases not now in institutions.

Among the more recent developments is the relationship of focal infections — located in the teeth, tonsils, sinuses, intestines, etc.—to the causation of "epilepsy" and "insanity." Individual cases and groups of cases have been reported in which convulsions and mental disturbances have ceased following the removal of foci of infection. The interest of the general practitioner, and the protection of the general public, to say nothing of the welfare of the patients themselves, demand that observations such as these from reliable sources be not ignored. Only a very few of even the large institutions are either organized or equipped to ascertain the basic facts as to focal infections among their populations; and no diagnostic survey of the kind demanded by modern scientific developments has ever been made.

In these circumstances it seems important that the general medical profession shall exert its influence to assist medical officers of these institutions in all efforts to secure an actual diagnostic study of their respective populations. This can probably best be done by securing, first, adequate equipment and, secondly, independent diagnostic commissions in each state. In this way the underlying pathologic and diagnostic facts will be ascertained, while the medical officers of the institutions, whatever may be their views as to the scientific questions involved, will be given not only valuable assistance but also protection against possible imputations of bias.

CHARLES A. L. REED, M.D., Cincinnati.

MISUSE OF THE WORD "EXTRACT"

To the Editor:—We are wont to popularize the usage of wrong terms until they reach a vogue and become common. As an example is the use of the word "extract" when applied to a desiccated gland product, when nothing like an extract is meant. Gould's dictionary says that an extract is "the condensed active principle of a drug." To be sure, a certain amount of moisture is removed by desiccation, but this does not make such a product an extract.

E. G. KYTE, M.D., Indianapolis.

PHYSICIANS INVITED TO ASSOCIATION FOR ADVANCEMENT OF SCIENCE

To the Editor:—It is desired to secure for membership in the American Association for the Advancement of Science a larger number of medical men. For this reason, at its recent meeting, the Executive Committee of the Council of the American Association for the Advancement of Science voted to invite the Members and Fellows of the Americal Medical Association to full membership without the payment of the usual five dollar entrance fee—that is, to admit them simply on the payment of the annual dues, namely, $5 a year.

It is unnecessary, of course, to take space here to inform medical men what the American Association for the Advancement of Science has done and is doing to advance science in the United States.

I shall be glad to hear from any Members or Fellows of the Association who desire further information.

BURTON E. LIVINGSTON, Permanent Secretary,
Smithsonian Institute Building,
Washington, D. C.

Queries and Minor Notes

ANONYMOUS COMMUNICATIONS and queries on postal cards will not be noticed. Every letter must contain the writer's name and address, but these will be omitted, on request.

SPRUE

To the Editor:—1. Is it settled that *Monilia psilosis* is the specific cause of sprue? 2. What is the result of treatment by monilia vaccines? 3. What is the best treatment for sprue? 4. What is the most complete and up-to-date work on sprue?

C. PUPO, M.D., San José, Costa Rica, Central America.

ANSWER.—1. The etiology of sprue is not known, but, of many etiologic theories, the monilia or oidium theory is most generally accepted.

2. Ashford, Michel, Taylor and others who have used monilia vaccines claim satisfactory results. Of sixty-two patients thus treated, forty-nine were reported as cured, twelve as improved, and one died (Michel).

3. The treatment of sprue, as yet, is symptomatic. Castellani and Chalmers say: "An attempt must be made to soothe the alimentary canal and to give it as little work to do as possible, so that it may repair itself. This line of treatment will necessitate rest in bed and a careful diet after the bowels have been swept as clear as possible of decomposing material." They say, further, that "the real basis of the treatment of sprue is the milk diet." Bovaird says of the treatment of sprue: "The one recommendation which seems to have general acceptance is that the diet must consist largely of fruit. The fame of strawberries in this relation is well known." An ethereal extract of strawberries for the treatment of sprue was recently described (*Brit. M. J.* **1**:718 [May 6] 1922) by Castellani and Browning.

4. Recent articles on sprue have been written by:

Bovaird, David: A Study of Tropical Sprue or Psilosis, THE JOURNAL, Sept. 3, 1921, p. 753.
Ashford, B. K.: Sprue, a Mycosis Superimposed on a State of Deficiency in Certain Essential Food Elements, *Am. J. Trop. Med.* **2**: 139-150 (March) 1922.
Michel, C.: Monilia Vaccine in Sprue, *J. Infect. Dis.* **22**: 53 (Jan.) 1918.
Rogers, L.: Vaccine Treatment of Sprue, *Indian M. Gaz.* **53**: 121 (April) 1918.
Castellani, A.: Treatment of Sprue by Massive Doses of Sodium Bicarbonate, *Brit. M. J.* **1**: 338 (March 5) 1921.
Ashford, B. K.: Dietetic Deficiencies Predisposing to Sprue, Pellagra and Beriberi in Porto Rico, *Bull. Porto Rico M. A.* **15**: 249-259 (Dec.) 1921.
Brown, T. R.: Employment of Pancreatic Extract in Treatment of Sprue, *Am. J. M. Sc.* **161**: 501 (April) 1921.
Castellani and Chalmers: Manual of Tropical Medicine, New York, William Wood & Co., 1920.
Byam and Archibald: The Practice of Medicine in the Tropics, London, Oxford Medical Publications, 1921.
Manson-Bahr: Manson's Tropical Diseases, New York, William Wood & Co., 1921.

PINTA

To the Editor:—I would appreciate your publishing something about the causative organism of pinta, a skin disease very frequent in this region, its treatment and a list of reference books I may consult. Please omit my name. M. J., M.D., Iguala, Mexico.

ANSWER.—Pinta is a disease variously designated as mal del pinto o de pinta, mal de los pintos (Mexico); carate (Colombia); cute (Venezuela), and quirica (Panama). It is supposed to be caused by several fungi, such as *Aspergillus, Penicillium, Monilia, Montoyella,* and perhaps a trichophyton. In the Mexican letter (THE JOURNAL, Oct. 1, 1921, p. 1116) there appeared a review of Dr. J. Gonzáles' investigations on the disease in Mexico and of his theory that the mosquito is the vector of the parasite.

References:

Montoya and Flórez: Thèse de Paris, 1898.
Castellani and Chalmers: Manual of Tropical Medicine, New York, William Wood & Co.
Sutton, R. L.: Diseases of the Skin, St. Louis, C. V. Mosby Company.
Lasso Meneses, S.: Dermatologia y la Enfermedad Azul de los Indios de Chillo, Guayaquil thesis, 1921.

Medical Education, Registration and Hospital Service

COMING EXAMINATIONS

ALASKA: Juneau, Sept. 5. Sec., Dr. Harry C. DeVighne, Juneau.
IDAHO: Boise, Oct. 3. Director, Mr. Paul Davis, Boise.
MASSACHUSETTS: Boston, Sept. 12-14. Sec., Dr. Samuel H. Calderwood, State House, Boston.
MINNESOTA: Minneapolis, Oct. 3-5. Sec., Dr. Thomas S. McDavitt, 539 Lowry Bldg., St. Paul.
MONTANA: Helena, Oct. 3. Sec., Dr. S. A. Cooney, Power Bldg., Helena.
NEW HAMPSHIRE: Concord, Sept. 7-8. Sec., Dr. Charles Duncan, Concord.
NEW YORK: Albany, Buffalo, New York and Syracuse, Sept. 25-28. Ass't. Professional Examinations, Mr. Herbert J. Hamilton, State Education, Albany.
PORTO RICO: San Juan, Oct. 3. Sec., Dr. M. Quevedo Baez, Box 804, San Juan.

Missouri January Examination

Dr. Cortez F. Enloe, secretary, Missouri State Board of Health, reports the written examination held at St. Louis, Jan. 23-26, 1922. The examination covered 14 subjects and included 105 questions. An average of 75 per cent. was required to pass. Of the 32 candidates examined, 28 passed and 4 failed, and one candidate, a graduate of the Kansas Medical College in 1900, with an average of 79.1 per cent., was licensed by special examination. The following colleges were represented:

College	PASSED	Year Grad.	Per Cent.
Chicago College of Medicine and Surgery		(1915)	79.2
Northwestern University		(1920)	85.1
Rush Medical College		(1920)	78.1
St. Louis University School of Medicine		(1908) 83, (1921) 80.1, (1922) 79.3, 79.6, 82.1, 82.3, 82.6, 84.1, 84.3, 84.8, 84.9, 86.6, 87.3	85.7,
Washington University		(1918) 83.7, (1920) 82.7, (1921) 78.1, 81.7, 86.7, 87.6	87.2,
Meharry Medical College		(1921)	75, 76
Queen's University		(1916)	88.2
	FAILED		
Baltimore Medical College		(1894)	*
St. Louis College of Physicians and Surgeons		(1915) (1917) 44.1, (1918) *	40,

* No grade given.

North Carolina June Examination

Dr. Kemp P. B. Bonner, secretary, North Carolina State Board of Medical Examiners, reports the oral and written examination held at Raleigh, June 26-30, 1922. The examination covered 7 subjects and included 70 questions. An average of 80 per cent. was required to pass. Of the 45 candidates examined, 37 passed and 8 failed. Twenty candidates were licensed by reciprocity. The following colleges were represented:

College	PASSED	Year Grad.	Per Cent.
George Washington University		(1921)	88
Howard University		(1922)	80
Emory University		(1920) 84, (1922)	84, 89
Tulane University		(1922) 80, 87, 88,	88, 91
University of Maryland		(1921) 88, (1922) 83,	84, 92
Harvard University		(1922)	86
Jefferson Medical College		(1921) 81, 88, (1922) 83, 84, 85, 85, 86, 87, 87, 89, 93	81, 83,
University of Pennsylvania		(1922) 87, 87, 89, 90,	92, 93
Medical College of Virginia		(1922) 83,	89, 89
	FAILED		
Howard University		(1920)	74
Emory University		(1922)	76
Tulane University		(1922)	77
National University of Arts and Sciences		(1916)	60
Jefferson Medical College		(1922)	74
Meharry Medical College		(1918) 77, (1920)	75
Medical College of Virginia		(1921)	76

College	LICENSED BY RECIPROCITY	Year Grad.	Reciprocity with
Atlanta College of Physicians and Surgeons		(1913)	Georgia
Atlanta Medical College		(1892)	S. Carolina
Atlanta School of Medicine		(1913)	Georgia
University of Georgia		(1888), (1898)	Georgia
Johns Hopkins University		(1899) Michigan, (1916)	Virginia
University of Maryland		(1896)	Georgia
Harvard University		(1902) Massachusetts, (1918)	S. Carolina
University of Michigan Medical School		(1910)	Ohio
Lincoln Memorial University		(1899)	S. Carolina
Coll. of Phys. and Surgs. in the City of New York		(1885)	New Jersey
Columbia University		(1919)	New York
North Carolina Medical College		(1906)	Oklahoma
Jefferson Medical College		(1910) Pennsylvania, (1917)	S. Carolina
Medical Coll. of the State of South Carolina		(1907), (1913)	S. Carolina
University of Nashville		(1905)	S. Carolina

Book Notices

CLINICAL SURGICAL DIAGNOSIS FOR STUDENTS AND PRACTITIONERS. By F. de Quervain, Professor of Surgery and Director of the Surgical Clinic at the University of Berne. Translated by J. Snowman, M.D. Third English edition. Cloth. Price, $14. Pp. 914, with 738 illustrations. New York: William Wood & Company, 1921.

When an author possessing such extraordinary clinical experience as Quervain combines with this experience great pedagogic ability and fine literary form, the results should approach the ideal. Books on surgical diagnosis are few; they represent years of compilation of material; and in order not to be weak where the experience of the author has been scant, they must be written by one who has had the opportunity to study a wealth of material, and keep excellent records. Originality is an outstanding feature of this work; facts are clearly and forcefully put. The dogmatic attitude often displayed is justified by the author's experience, and the aid to forcefulness which such dogmatism lends. This is not a textbook that an undergraduate student will easily read "from cover to cover." It is too lengthy; it contains myriads of closely stated facts; and the author's method of frequently citing case reports to illustrate clinical pictures is more readily grasped by the clinician than by the student. The usual outline is followed, beginning with the head and ending with the extremities. The chapters dealing with the abdomen are brilliant. One exception to be noted is the lack of attention devoted to the dyspepsias of extragastric origin. The extremities are treated as a regional anatomy would treat them. This method is open to the criticism of requiring repetition; nevertheless, these are excellent chapters. The illustrations are well chosen. The book, as a whole, is one that an experienced surgeon may study with profit.

THE SPLEEN AND SOME OF ITS DISEASES. Being the Bradshaw Lecture of the Royal College of Surgeons of England, 1920. By Sir Berkeley Moynihan. Cloth. Price, $5 net. Pp. 129, with 13 illustrations. Philadelphia: W. B. Saunders Company, 1921.

This volume, written in the usual clear style of the author, contains an interesting and instructive summary of what is known at present concerning the spleen. There probably have been more hypotheses and theories suggested regarding the function of the spleen than of any other organ in the body. The problems of the function of the spleen and the relations, if any, of this organ to certain disease conditions have not been easy to solve, nor are they by any means entirely solved now. It is interesting to follow the gropings of physiologists, pathologists and clinicians through darkness into a faint light, for the light which is shed on the spleen is still quite dim. It is encouraging, however, to note that our knowledge has advanced to the point at which the spleen is no longer viewed as an isolated organ independent of the rest of the body, but is in function and dysfunction correlated with other organs and systems. The progress that has been made in this direction is clearly set forth by the author.

DIE INNERE SEKRETION. Eine Einführung für Studierende und Aerzte. Von Dr. Arthur Weil, Privatdozen der Physiologie an der Universität Halle. Second edition. Paper. Price, 90 marks. Pp. 146, with 46 illustrations. Berlin: Julius Springer, 1922.

This book contains a brief summary of the facts and theories in the field of endocrinology, intended primarily for medical students and practitioners. It is a compilation by a teacher, rather than a monograph by a worker in the field. The plan of the book is excellent. Each functional system of the body, such as the circulation, nervous system and alimentary canal, is considered from the point of view of the action of "hormones" on it. But the exposition is inferior to the plan. In many cases the author shows the lack of critical judgment of a compiler. For example, he states as a demonstrated fact the secretory control of the vagus nerves on the islands of Langerhans in the pancreas. The book is well illustrated, but there are no references to the original literature. Many medical students and practitioners want to consult the original literature; monographs on special phases

of physiology and medicine written especially for these groups should accordingly contain references to the most important original investigations in the field.

LE DISPENSAIRE MARIN. Un Organisme Nouveau de Puériculture. Par J. Jarricott, Membre Conseiller du Bureau Permanent de L'Union Internationale pour la Protection de L'Enfance du Premier Age. Paper. Price, 60 francs net. Pp. 637, with 216 illustrations. Paris: Masson & Cie, 1921.

This is a monograph on the use of sea water in the treatment of malnutrition in infants and young children. The sea water is given by mouth or rectally. Most of the book is taken up with detailed case reports. It is amply illustrated with pictures of the children before and after treatment, and with charts of weight curves and comparative results. The treatment is simple and easily applied, but one wonders whether the exaggerated claims of the author are justified in view of the complicated conditions which must be met, and the great variation in the reactions which such children show to treatment.

Medicolegal

Roentgenograms and Subjects for Expert Testimony

(Asch v. Washburn Lignite Coal Co. et al. (N. D.), 186 N. W. R. 757)

The Supreme Court of North Dakota says that there were introduced in evidence in this personal injury case, in behalf of the plaintiff, two roentgenograms, one of a portion of the plaintiff's spine, and the other of one of his feet. The physician who took these roentgenograms was placed on the stand as a witness for the plaintiff. After identifying the plates, and stating that they were in the same condition as when they were taken, he was permitted to interpret and explain them. He was also permitted to give his opinion as an expert as to the nature and extent of the injuries as disclosed by such plates. It was contended that the rulings incident to the reception of all of this evidence were erroneous. But the court deems it proper to say that it was not apparent that the trial court erred in admitting the roentgenograms in evidence. Nor does this court believe that the court erred in permitting the physician to explain the roentgenograms. One of them showed a dislocation or subluxation of a vertebra. The other showed a fracture of a small bone in one of the plaintiff's feet. While it is true the roentgenograms themselves were the best evidence of what they showed, it is equally true that a roentgenogram may wholly fail to convey to an ordinary layman the facts as they actually are there shown; and the court believes that it is proper for an expert to explain a roentgenogram in particulars that are not understood by a layman. Nor does this court believe that the trial court erred in permitting the physician to give his opinion as an expert as to the nature and extent of the injury, and its probable duration and effect. The authorities generally hold these matters to be a proper subject of expert testimony. In short, the court holds that where roentgenograms have been proved by a physician, it is competent for him to explain them to the jury in particulars that are not understood by laymen; also, that it is proper to receive the opinions of medical experts as to the nature and extent of personal injuries.

Competent Testimony as to Blood and Bloodstains; Use of Commercial Serums

(Mohler v. Commonwealth (Va.), 111 S. E. R. 454)

The Supreme Court of Appeals of Virginia says that, in this homicide case, a physician who was also city coroner and fully qualified as an expert in such chemical analyses testified that, in his opinion, certain stains submitted to him for examination were human blood, and that the substances submitted to him for tests were human blood. He testified that he first undertook to produce the serum which was necessary by inoculating rabbits; but, for reasons which he explained, determined not to use the serum so made by himself in a test of such a delicate nature and probably having such far-reaching consequences. Instead, he bought a serum prepared by a firm of recognized chemists for the express purpose of making the blood tests; that before using it he fully tested it, in order to discover whether it was reliable, on samples of blood which he knew to be human blood as well as on samples of the blood of a chicken, a hog, a mule and a sheep; and that, when thus fully tested, it indicated that it had been properly prepared and was in all respects suitable for such a test. The court considers that the testimony of this witness was singularly clear and satisfactory, was properly introduced in every respect and was worthy of the consideration of the jury in the determination of the fact which the commonwealth was endeavoring to establish. The assignment of error with regard to it was clearly without merit.

Damages Allowed Physician for Personal Injury

(Stevenson v. Davis, Director General of Railroads (Pa.), 116 Atl. R. 318)

The Supreme Court of Pennsylvania says that the plaintiff, a practicing physician, aged 69, while a passenger in a car was struck on the head by a suit case or hand satchel falling from a rack above the seat in which he was sitting. There was evidence that he was rendered unconscious, and, as a result of the injury, became unable to practice his profession to the same extent as before the accident, his earnings having decreased from $7 or $10 a day to $2.50 a day; that his eyesight and memory had become impaired, as had also his general physical condition. A verdict was rendered in his favor for $7,250. The court below having refused a new trial, the defendant appealed. The statement of the question involved was whether the size of the verdict was manifestly too great and plainly the result of prejudice. The supreme court found nothing in the record indicating prejudice against the defendant, and it cannot say that the verdict was so excessive as to warrant its inference on that ground, in view of the testimony establishing the injury received by the plaintiff and its effect on him and the resultant decrease in the receipts from his professional calling; wherefore, the judgment for the plaintiff is affirmed.

Society Proceedings

COMING MEETINGS

American Academy of Ophthalmology and Oto-Laryngology, Minneapolis, Sept. 19-23. Dr. Luther C. Peter, 1529 Spruce St., Philadelphia, Sec'y.

American Association of Obstetricians, Gynecologists and Abdominal Surgeons, Albany, N. Y., Sept. 19-21. Dr. James E. Davis, 111 Josephine Ave., Detroit, Secretary.

American Child Hygiene Association, Washington, D. C., Oct. 12-14. Miss G. B. Knipp, 111 Cathedral St., Baltimore, Md., Secretary.

American Electro-Therapeutic Association, New York, Sept. 19-22. Dr. A. Bern Hirsh, 71 W. 94th St., New York, Secretary.

American Roentgen Ray Society, Los Angeles, Sept. 12-16. Dr. H. E. Potter, 122 S. Michigan Ave., Chicago, Secretary.

Association of Military Surgeons of the United States, Washington, D. C., Oct. 12-14. Col. James Robb Church, M. C., U. S. Army, Medical Museum and Library, Washington, D. C., Secretary.

Colorado State Medical Society, Colorado Springs, Oct. 3-5. Dr. F. B. Stephenson, Metropolitan Bldg., Denver, Secretary.

Delaware State Medical Society, Dover, Oct. 10. Dr. W. O. La Motte, Industrial Trust Building, Wilmington, Secretary.

Indiana State Medical Association, Muncie, Sept. 27-29. Dr. Charles N. Combs, Terre Haute, Secretary.

Medical Association of the Southwest, Hot Springs, Ark., Oct. 4-6. Dr. W. H. Bailey, 115 West 21st Street, Oklahoma City, Okla., Sec'y.

Minnesota State Medical Association, Minneapolis, Oct. 12-13. Dr. Carl B. Drake, Central Bank Building, St. Paul, Secretary.

Mississippi Valley Medical Association, Rochester, Minn., Oct. 10-12. Dr. Henry Enos Tuley, 244 Francis Bldg., Louisville, Ky., Secretary.

Missouri Valley, Medical Society of the, St. Joseph, Mo., Sept. 21-22. Dr. Charles W. Fassett, 115 E. 31st St., Kansas City, Mo., Secretary.

Nevada State Medical Association, Reno, Oct. 6-7. Dr. Horace J. Brown, Goldfield, Secretary.

Pacific Coast Oto-Ophthalmological Society, Salt Lake City, Sept. 14-16. Dr. Edward D. LeCompte, Boston Bldg., Salt Lake City, Utah, Sec'y.

Pennsylvania, Medical Society of the State of, Scranton, Oct. 2-5. Dr. W. F. Donaldson, Jenkins Arcade, Pittsburgh, Secretary.

Utah State Medical Association, Salt Lake City, Aug. 31-Sept. 2. Dr. W. L. Rich, Boston Bldg., Salt Lake City, Secretary.

Vermont State Medical Society, Burlington, Oct. 12-13. Dr. W. G. Ricker, St. Johnsbury, Secretary.

Washington State Medical Association, Tacoma, Sept. 5-6. Dr. C. H. Thomson, 508 Cobb Bldg., Seattle, Secretary.

Wisconsin, State Medical Society of, Green Lake, Sept. 6-8. Dr. Rock Sleyster, Wauwatosa, Secretary.

Current Medical Literature

AMERICAN

Titles marked with an asterisk (*) are abstracted below.

American Journal of Anatomy, Philadelphia

July, 1922, **30**, No. 4

Reaction of Cells Lining Peritoneal Cavity, Including Germinal Epithelium of Ovary, to Vital Dyes. R. S. Cunningham, Baltimore.—p. 399.

Changes in Vaginal Epithelium of Guinea-Pig During Oestrous Cycle. R. M. Selle.—p. 429.

*Nature of Mitochondria. III. Demonstration of Mitochondria by Bacteriologic Methods. IV. Comparative Study of Morphogenesis of Rootnodule Bacteria and Chloroplasts. I. E. Wallin, Boulder, Colo.—p. 451.

Differential Susceptibility as Basis for Modification and Control of Development in Frog. II. Types of Modification Seen in Later Developmental Stages. A. W. Bellamy.—p. 473.

Particular Form of Atresia of Follicules of De Graaf (Lapine), Revealed by Iron Tannate Method. A. L. Salazar, Portugal.—p. 503.

Nature of Mitochondria.—Wallin submits evidence which he believes supports the conclusion that mitochondria are symbiotic bacteria in the cytoplasm of the cells of all higher organisms whose symbiotic existence had its inception at the dawn of phylogenetic evolution.

American Journal of Obstetrics and Gynecology, St. Louis

July, 1922, **4**, No. 1

*Pregnancy and Heart Disease from Medical Viewpoint. W. W. Herrick, New York.—p. 1.

*Effect of Injection of Extract of Anterior Lobe of Pituitary Gland on Organs of Generation. I. Kross, New York.—p. 19.

*Phenoltetrachlorphthalein Test for Liver Function in Pregnancy. P. F. Williams, Philadelphia.—p. 26.

Uterine Polyps. S. H. Geist, New York.—p. 30.

*Syphilis in Relation to Abortion, Stillbirths and Infant Mortality. W. G. Cosbie, Toronto, Ont.—p. 40.

Hydatidiform Mole: Report of Ten Cases. G. L. Brodhead, and F. A. Kassebohm, New York.—p. 45.

Pregnancy Toxemia Known as Eclampsia. R. McPherson, New York.—p. 50.

Better Obstetrics and Problem of Birth Injuries of New-Born Infant. H. Ehrenfest, St. Louis.—p. 61.

Organic Diseases of Nervous System Complicating Pregnancy: Report of Two Cases. E. A. Shumann and H. S. Fist, Philadelphia.—p. 67.

*Abdominal Pregnancy as Observed in Charity Hospital of New Orleans. P. Graffagnino, New Orleans.—p. 71.

Pregnancy and Heart Disease.—Herrick's experience with forty cases of chronic valvular disease in pregancy has emphasized the importance of the following points: An antenatal clinic is essential in detecting the early evidences of decompensation. All cases showing decompensation in any period of pregnancy should be admitted to the hospital and given medical treatment, no matter what the stage of pregnancy. Induction of labor should never be attempted in a case of decompensation until thorough trial has been made of medical measures. The response to medical treatment of the average case of chronic valvular disease of the heart in pregnancy is satisfactory, and the same principles govern its treatment as govern the treatment of such cases not associated with pregancy. The termination of pregnancy in the presence of chronic valvular disease of the heart is not a matter about which hard and fast rules can be laid down. In general, if decompensation occurs early in pregnancy, or if it does not respond to medical treatment, if it has occurred and been severe despite proper care in previous pregnancies and if the signs and symptoms indicate serious lesion, termination is usually wise. The method by which pregnancy should be terminated is largely an obstetric question, the point of greatest importance being the guarantee of a short and easy second stage.

Effect of Anterior Pituitary Lobe on Generative Organs.—Kross states that extract of anterior pituitary lobe has no stimulating effect, either on growth in general or on the sexual maturity and activity of the organs of generation in the white rat.

Phenoltetrachlorphthalein Test for Liver Function in Pregnancy.—From Williams' work it would appear that the functional activities of the liver are under a greater strain in the pregnant than in the nonpregnant state. The liver, under this augmentation of its functional capacity, undergoes a mild degree of fatty degeneration in normal pregnancy, which condition increases at times, under the various morbid conditions peculiar to pregnancy, to extreme degrees of degeneration, necrosis, hemorrhage and autolysis. The degenerations of the liver are probably secondary to the causes of the toxemias, and may be largely due to an exhaustion of its glycogenic ability. The various tests for determining the functional ability of the liver in pregnancy are not sufficiently valuable from a quantitative standpoint. The phenoltetrachlorphthalein duoden elimination time test has been performed on a number of normally pregnant women, with fairly constant end reactions, and in several pathologic cases, with variable results where liver damage might reasonably be suspected to be present.

Syphilis in Relation to Abortion and Infant Mortality.—Four and three tenths per cent. of 1,674 mothers reacted positively to the Wasserman test. Fifty-three children were born to mothers with definitely positive reactions. Of these twenty-eight gave positive cord Wassermann reactions, twenty-one were negative and in four the tests were not categorized. Of the twenty-eight positive children ten are still alive, at ages varying from a few months to between 2 and 3 years. Ten have died and eight have been lost to the records. Of the twenty-one children with negative reactions thirteen are living, one has died and seven are off the records. One of the four in which the reaction was indefinite is known to be alive, the other three cannot be traced. In fifty pregnancies in syphilitic mothers, there were fourteen stillbirths and twelve deaths of the infant, yielding a birth rate loss of slightly more than 50 per cent.

Abdominal Pregnancy.—Each of Graffagnino's eleven patients was a colored woman. The ages ranged from 20 to 90, in the last instance the diagnosis being established by postmortem many years after the pregnancy occurred. The only fatality in the series of operated cases occurred in the only case in which the fetus was viable. In the other cases, in which the operation was deferred beyond term, or where the child was taken before the patient was at term, the results were uniformly successful, proving, in Graffagnino's opinion, that abdominal section, where the diagnosis of abdominal pregnancy is established, has not higher mortality than ordinary gynecologic surgery, provided the operation is timed correctly.

American Journal of Ophthalmology, Chicago

July, 1922, **5**, No. 7

Lipemia Retinalis: Report of Three Cases. H. P. Wagener, Rochester, Minn.—p. 521.

So-Called Solid Edema; Lymphoma. A. J. Bedell, Albany, N. Y.—p. 526.

Retinitis Proliferans from Anemia Produced by Hodgkin's Disease. G. H. Bell, New York.—p. 531.

Intra-ocular Foreign Body of Forty-Six Years' Duration. W. S. Franklin and F. C. Cordes, San Francisco.—p. 533.

Technic of Observation with Gullstrand Slit Lamp. R. Von Der Heydt, Chicago.—p. 537.

Homatropin Cycloplegia. Its Efficiency and Dangers. W. W. Lewis, St. Paul.—p. 540.

Entropion Following Influenza, with New Surgical Procedure. C. A. Clapp, Baltimore.—p. 542.

Wrestlers' Trachoma. J. M. Patton, Omaha.—p. 545.

Superficial Punctate Keratitis. E. D. Watkins, Memphis, Tenn.—p. 546.

Two Cases of Exophthalmos. H. J. Heeb and W. Van De Erve, Milwaukee.—p. 548.

Archives of Internal Medicine, Chicago

July, 1922, **30**, No. 1

Functions and Integration of Intercostal Muscle. C. F. Hoover, Cleveland.—p. 1.

*Estimation of Normal Vital Capacity; with Especial Reference to Effect of Posture. C. D. Christie and A. J. Beams, Cleveland.—p. 34.

*Capillary Blood Pressure in Arterial Hypertension. E. P. Boas and S. Frant, New York.—p. 40.

*Electrocardiographic Study of Fifty Patients During Operation. W. G. Lennox, Peking, China; R. C. Graves and S. A. Levine, Boston.—p. 57.

*Physiology of Liver. II. Effect of Removal of Liver on Blood Sugar Level. F. C. Mann and T. B. Magath, Rochester, Minn.—p. 73.

*Elimination of Arsenic in Urine of Syphilitic Patients After Intravenous Injection of Arsphenamin. C. Weiss and G. W. Raiziss, Philadelphia.—p. 85.

*Comparison of Capillary and Venous Blood in Pernicious Anemia. W. W. Duke and D. D. Stofer, Kansas City, Mo.—p. 94.

Studies on Nature of Nonspecific Protein in Disease Processes. IV. Blood Fragility, Reticulation and Blood Chemistry. R. M. Greenthal and G. M. Brown, Ann Arbor, Mich.—p. 99.
*Dietetic Treatment of Chronic Arthritis and Its Relationship to Sugar Tolerance. A. A. Fletcher, Toronto.—p. 106.
Variations in Aliquot Fractions of Gastric Contents. N. Kopeloff, New York.—p. 118.

Effect of Posture on Vital Capacity.—After computing the averages of all estimations on 290 normal men and women, Christie and Beams found that there was 5.5 per cent. less vital capacity in the lying than in the sitting position. About 80 per cent. of all persons breathed 6 or 7 per cent. less when lying. No difference in chest conformation accounted for these variations. The only thing which seemed to point to a different response from certain types of chest was in the case of obese women. In every instance the fleshy female breathed about 15 per cent. less lying than sitting. Individuals of the same sex and body weight have very great differences in their vital capacity; individuals of the same sex and height have more nearly the same vital capacity. It was found that only about 8 per cent. of all males and about 9 per cent. of all females, when grouped according to body surface, missed their respective group average by more than minus 10 per cent.

Capillary Blood Pressure in Arterial Hypertension.—Boas and Frant state that in patients with normal blood pressures the blood pressure in the capillaries of the fingers rarely exceeds 30 mm. of mercury. Patients with hypertension fall within two groups that cannot be differentiated clinically. In the first group the capillary pressure ranges between 21 and 70 mm. of mercury, rarely higher and only very exceptionally lower. Most of the readings fall between 30 and 60. In the second group the capillary pressure falls within the range of normal, with a tendency to be low rather than high. It is possible that patients who exhibit high capillary pressures are suffering from a general capillary disease with a glomerulonephritis as one of the manifestations. If this view is confirmed, the estimation of the capillary pressure may prove an important aid in the differential diagnosis of glomerulonephritis from other forms of kidney disease. In essential hypertension the capillary pressure is low. In any given individual varying pressures are usually observed in different capillaries. The variability of the capillary pressure is greater in patients with high readings. It depends on physiologic as well as on anatomic moments. Mechanical stimulation of the capillaries will alter the blood flow, as well as the blood pressure within the capillaries.

Electrocardiographic Studies.—In many cases studied by Lennox et al. the electrocardiographic tracings revealed a heart rate considerably faster than the pulse rate recorded by the anesthetist. About one half of the cases showed some abnormality of the mechanism of the heart beat, not present in preliminary tracings, the most prominent being: paroxysmal auricular tachycardia; premature beats, and marked displacement of the cardiac pacemaker. Various factors which might contribute to the production of the abnormalities named are analyzed. Only those which might possibly be concerned with alterations in vagal tone seem to be of importance. The observed abnormalities of the heart beat were transient and unassociated with clinical signs of embarrassed circulation. In the main, they were of physiological rather than of clinical significance.

Effect of Hepatectomy on Blood Sugar.—Mann and Magath noted a marked and progressive decrease in the blood sugar following total removal of the liver. The glycogen content of the muscles also decreases. Coincident with this decrease in blood sugar, a characteristic group of symptoms develop and progress until death occurs. This effect of hepatectomy on blood sugar has been observed in markedly different species; namely, dog, goose, turtle, and fish. In each species investigated, removal of the liver produced a marked decrease in blood sugar. The relationship of the decrease in blood sugar and the development of the characteristic symptoms seems to be one of cause and effect.

Elimination of Arsenic After Arsphenamin Administration.—The elimination of arsenic in the urine was studied by Weiss and Raiziss in three cases of tertiary syphilis which were under arsphenamin treatment. Very small quantities of arsenic, detectable only by very delicate methods of analysis, were found in the daily urine. Thus, after a dose of 0.6 gm. containing from 187 to 188.6 mg. arsenic, from 3 to 8.8 per cent. was eliminated in three days and from 4.9 to 13.5 per cent. in the course of a fortnight. By far the greatest amount of arsenic eliminated by the kidneys is, therefore, found in the urine of the first three days after injection. During the succeeding days the amounts gradually decline until by the fourteenth day they usually fall to a level of from 0.1 to 0.5 mg. which approaches the limit of accuracy of the method used.

Capillary and Venous Blood in Pernicious Anemia.—Capillary red blood cell counts made by Duke and Stofer on patients with pernicious anemia were on an average 17.6 per cent. higher than similar counts made on venous bloods at the same time. An increased number of macrocytes was observed in capillary blood as compared with venous blood. This striking difference between the capillary and venous counts, the authors believe, is caused by a tendency for the larger red blood cells (macrocytes) to lag in the narrow capillary bed where the rate of flow of blood is slow and the pulse is lost. It is believed that this accounts, in part for the circumstance that a patient with pernicious anemia may have relatively good color of skin and lips even though he may be gravely anemic. This is misleading and frequently obscures the real gravity of the situation.

Diet in Arthritis and Sugar Tolerance.—Of 100 cases of chronic arthritis investigated by Fletcher, reduction of diet alone appeared to result in the recovery of eight patients and in quite evident improvement in forty-three. The sugar tolerance was decreased in the large majority of these cases, and this decrease showed no relationship to the severity of the disease. Patients who have a low tolerance are much more frequently benefited by reduction in diet than those cases with a normal tolerance. In certain cases of chronic arthritis, dietetic regulation appears to be the most effective form of treatment, and while the value of such treatment in an individual case cannot be determined with certainty, the lowering of the sugar tolerance is a useful clinical indication for this procedure. Female patients derive greater benefit from such treatment that men, and, as a rule, they show a lower tolerance.

Archives of Surgery, Chicago

July, 1922, **5**, No. 1

*Residual Lactation Acini in Female Breast. J. McFarland, Philadelphia.—p. 1.
*Proper Treatment of Chronic Malign Diseases of Superficial Lymph Glands. J. L. Yates, Milwaukee.—p. 65.
Value of Artificial Aids to Respiration in "Acute Operative Collapse of Lungs" (Surgical Pneumothorax) Occurring in Course of Intrathoracic Operations. R. Matas, New Orleans.—p. 110.
Negative Chamber in Open Pneumothorax. W. Meyer, New York.—p. 134.
*Value of Ventriculograms in Localization of Intracranial Lesions. E. B. Towne, San Francisco.—p. 144.
*Changes in Morphology and Function of Bone Marrow After Splenectomy. E. M. Johnstone, Rochester, Minn.—p. 159.
*Pathologic Changes in Muscle as Result of Disturbances of Circulation. Experimental Study of Volkmann's Ischemic Paralysis. B. Brooks, St. Louis.—p. 188.

Residual Lactation Acini in Female Breast.—The accumulated cellular and amorphous debris resulting from involution, McFarland says, sometimes obstructs the outlets of the ducts and acini, leading to retention of secretion and exudation of fluid with cyst formation. The pressure exerted on the surrounding tissue by the growing cyst gives rise to sensory disturbances that vary in intensity according to the firmness or softness of the stroma. In a breast with stroma largely mucinoid or adipose, they may occasion no symptoms. The cysts are benign and harmless. If they become large their excision may be indicated to make the patient more comfortable. Cancer cysts are not specific entities. They are the result of the accidental coexistence of cysts and cancer in the same breast. Original contiguity followed by increase in the size of each determines final continuity. The so-called chronic cystic mastitis is not inflammatory, and is not a pathologic entity; it is nothing but a result—or at most a perversion—of involution. It would, therefore, be desirable to abandon the term, and call the condition "cystic disturbance of the breast," or if it seems better to retain one of the older designations, that of Warren—"abnormal involution"—is probably least objectionable. The only difficulty lies in clearly

defining when the process of involution can be said to become abnormal, when it is so diversified.

Treatment of Malign Diseases of Superficial Lymph Glands.—The operative methods described by Yates have been evolved from fifteen years' experience in treating the most malignant lymphomas, those due to the Hodgkin's group of diseases. They have been applied also in combating carcinomatous and tuberculous adenitis wherein the problems and solutions are quite identical. Locations of dangerous glands have been determined at operation and at necropsy. Unusually extensive excisions are advocated because less radical operations have been followed by recurrences, and the reasons for the recurrences were found to have been affected glands that could have been excised at the first operation without having added materially to the patient's burdens. Studies of tissues removed from patients suffering from cancer or tuberculosis have demonstrated that although the lymph gland involvement in these diseases is usually less general than it is in the diffuse types of Hodkgin's disease or lymphocytic leukemia, nevertheless, virtually any of the glands and rarely all of the glands so affected may be invaded by tuberculosis and cancer. Technical details are given which are applicable to all dissections. Briefly, they are: Skin flaps should be reflected completely as the first step, kept covered with warm moist gauze, and protected from pressure until replaced. Dissections of deep tissues should be concentric; as soon as an area is exposed, bleeding vessels should be ligated and hot moist dressings applied. Sharp dissection is superior. After dissection is completed, dead spaces are obliterated so far as possible by suture or tissues so fixed by suture that the pressure of bandages will lead to their obliteration. A muscle floor is to be fashioned on which the skin flaps, that have become skin grafts to a large extent, shall rest and from which they are to obtain their circulation. Accurate hemostasis is imperative. Drainage is not always necessary; but if small soft tubes are used and removed early, smooth healing is more certain. Accurate approximation of the skin incisions minimizes scars.

Value of Ventriculograms in Brain Lesions.—Three cases of obstructive hydrocephalus and one of brain tumor are reported by Towne in which roentgenograms were made of air-filled cerebral ventricles for the differentiation of the types of hydrocephalus and for the localization of brain tumors. Three were different types of obstructive internal hydrocephalus in infants; and in each, the site of the obstruction was demonstrated by the ventriculogram. One of these cases is an example of the rare condition of obstructive hydrocephalus of one lateral ventricle. In the fourth case, the clinical symptoms suggested a frontal lobe tumor; but there was nothing to indicate which hemisphere was involved. The ventriculogram showed that it lay on the left side, where it was found at operation.

Changes in Bone Marrow After Splenectomy.—The new method of marrow study which Johnstone devised for this series of experiments consists of five essential features: (1) A rib marrow specimen removed before splenectomy is used as a control for a series of subsequent specimens removed at intervals after splenectomy. (2) Series of similar rib marrow specimens from normal nonsplenectomized dogs furnished an additional control for the experiments. (3) Rib marrow specimens removed at frequent intervals after splenectomy give a connected picture of marrow changes. (4) The observations on the marrow are correlated with parallel observations on the blood and on the general condition of the animal. (5) Ether anesthesia and cocain anesthesia are used in separate series of experiments in order to test the influence of the anesthetic on the marrow.

Changes in Muscle Result of Circulation Disturbances.—That the classic picture of Volkmann's ischemic paralysis could only be explained on the basis of acute venous obstruction is quite clear to Brooks. As a matter of fact, however, it is customary to refer to every case of contracture following the application of a tight bandage, tourniquet, plaster cast, or splint as Volkmann's ischemic contracture. Undoubtedly, he says, some of these cases are due to pure local pressure necrosis, entirely analogous to the decubitus ulcer, or pressure sore on the heel or over the anterior superior iliac spine from continued pressure of a plaster cast. In those instances in which a bandage or splint is applied to an extremity presumably never so tight as to obstruct immediately and completely the circulation distal to constriction, and in which there follows in the course of a few hours great pain and cyanosis which make the constriction no longer bearable, and in which removal of the splint is followed by swelling, heat, tenderness, and a rapidly developing contracture, one is forced to the assumption that the etiologic factor is either an acute venous obstruction or a temporary pressure anemia followed by a reestablishment of circulation through the damaged tissue. The ease with which the former is reproduced experimentally is evidence of its being the most important etiologic factor of contractures following the application of constricting dressings in the treatment of fractures. The reproduction of areas of degeneration and subsequent fibrosis of muscles by temporary anemia is so difficult experimentally that it is rather unlikely that the exact set of conditions for its causation would be present in any clinical instance.

Arkansas Medical Society Journal, Little Rock

July, 1922, **19**, No. 2

Physician; His Professional and Civic Duties. C. H. Cargile, Bentonville.—p. 15.
Importance of Birth and Death Registration. G. A. Warren, Black Rock.—p. 18.

Canadian Medical Association Journal, Toronto

July, 1922, **12**, No. 7

Syphilis—Three Years' Observation. E. J. Trow, Toronto.—p. 455.
Medical Care of Postoperative Abdominal Cases. R. D. Rudolf, Toronto.—p. 458.
*Infantile Eczema. H. Spohn, Vancouver, B. C.—p. 461.
Exanthem Subitum—Report of Five Cases. A. Goldbloom, Montreal.—p. 467.
*Formol-Gel Reaction in Blood Serum of Syphilitics. C. A. Watson, Montreal.—p. 469.
Clinical Diagnosis of Syphilis. H. A. Dixon, Toronto.—p. 470.
Pyelitis During Pregnancy and Puerperium. C. J. Currie, Toronto.—p. 474.
Use of Roentgen-Rays in Diseases of Skin. G. E. Richards, Toronto.—p. 478.
Eye Conditions in Pregnancy. C. Graef, New York.—p. 481.
Cause, Symptoms and Diagnosis of Nasal Sinusitis in Their Relation to General Practice. W. S. Hunt, Port Arthur.—p. 484.
*Simple Cross Agglutination Test for Blood Donors, Using Hemolysed Blood. N. M. Guiou, Ottawa.—p. 488.
Bronchopneumonia Following Aspiration of Zinc Stearate Powder. A. Goldbloom, Montreal.—p. 491.
Phlegmonous Gastritis with Cirrhosis of Liver. J. P. Anderson, Toronto.—p. 492.

Infantile Eczema.—Thirty-three breast fed infants, twenty-two fed on cow's milk and sugar, and fifteen on mixed feedings, with cow's milk were studied by Spohn. In 39 per cent. there was a definite family history of either eczema, persistent head colds, bronchitis or asthma. Fifty-seven per cent. were over weight or normal in weight. In 70 per cent. of the breast fed of this series there was a history of being fed every three hours or oftener. In 63 per cent. there was a definite history of fat intolerance. In 56 per cent. sugar had an irritating effect on the skin condition. Dietotherapy and local treatment meets generally with a quick response. Sixty-five per cent. were clear of eczema in less than three months and remained clear if they adhered to treatment. Twenty-four per cent. took from three months to 9 months to become clear, i. e., 89 per cent. were able to keep clear of eczema. Three cases showed only slight improvement.

Formol Gel Reaction in Syphilis.—Of 114 unanalyzed cases, examined by Watson, there was an agreement between the Wassermann and formol-gel reactions in seventy-four cases, or 65 per cent. Of the eighty-seven analyzed cases there was an agreement in 60 of them, or 65 per cent. Watson is of the opinion that the "formol-gel" test is not as reliable as the Wassermann reaction.

Agglutination Test for Blood Donors.—The test described by Guiou depends for a reaction on rapid freezing and thawing of a few drops of blood mixed with isotonic sodium citrate solution.

Colorado Medicine, Denver

July, 1922, **19**, No. 7

Antivivisection vs. Modern Medicine. G. W. Stiles, Denver.—p. 134.
Stomach and Circulatory Systems as Related to One Another. J. L. Mortimer, Denver.—p. 142.

Operative Treatment of Goiter. L. Freeman, Denver.—p. 144.
Chronic Carbon Monoxid Amblyopia. H. M. Thompson, Pueblo.—p. 145.
Extensive Case of Verrucae Plantares. G. P. Lingenfelter, Denver.—p. 147.

Indiana State Medical Association Journal, Ft. Wayne

July, 1922, **15**, No. 7

*Abdominal Trauma. W. U. Kennedy, New Castle.—p. 221.
Sterility in Female. G. B. Jackson, Indianapolis.—p. 224.
Aspects of Recent Surgical Progress. W. E. Gabe, Indianapolis.—p. 229.
Case of Bezold's Mastoiditis Preceded by Thirty Years Middle Ear Suppuration. C. N. Howard, Warsaw.—p. 232.
Shall We Advertise? E. G. Reynard, Union City.—p. 235.

Abdominal Trauma.—Kennedy discusses five cases from which he is convinced that trauma may, by its action on the sympathetic, set up a type of peritonitis, nonseptic in character, relatively slow in development but capable of producing almost irremediable damage. The diagnosis rests on a history of abdominal trauma, with shock which is soon ameliorated, a persistent abdominal rigidity which continues after the patient should be free from symptoms, a persistent nausea, a more or less fixed doughy mass, obstinate constipation increasing in severity, a nearly silent abdomen with peristalsis abruptly terminating at a fixed place, when it can at all be elicited, and a gradual toxemia from intestinal statis. The roentgen ray will show an ill defined mass of barium in the small intestine, usually somewhat movable, with definite delay in the head of the meal reaching the cecum, without the definite outline of a diverticulum and with a larger outline than a diverticulum, the colon showing no abnormality. Auscultation will reveal evidences quite equal to that gained by percussion or palpation and in this as well as other forms of obstruction, the silence is significant. In certain phases it is permissible to use small injections of pituitary extract to emphasize blocking of peristalsis. In the acute types, an immediate laparotomy is indicated to establish the pathologic condition and to do such form of repair as will reestablish the fecal current. The widespread adhesions may be dissected loose and used to partly cover raw surfaces, supplementing these with omental flaps and Cargile membrane. In the more chronic types a reestablishment of current would be difficult and in such instances short circuiting will be indicated and even resection of masses of agglutinated bowel.

Iowa State Medical Society Journal, Des Moines

July, 1922, **12**, No. 7

Relation of Splenic Syndromes to Pathology of Blood. W. J. Mayo, Rochester, Minn.—p. 243.
Diagnosis of Foreign Bodies in Bronchi. T. McCrae, Philadelphia.—p. 248.
Fractures of Lower End of Radius. P. A. Bendixen, Davenport.—p. 252.
Mental Standardization. F. A. Ely, Des Moines.—p. 259.
Surgical Injuries to Bile Passages. A. E. Acher, Fort Dodge.—p. 262.
Sheppard-Towner Bill. K. Harpel, Boone.—p. 265.

Journal of General Physiology, Baltimore

July, 1922, **4**, No. 6

Stability of Bacterial Suspensions. I. Convenient Cell for Microscopic Cataphoresis Experiments. J. H. Northrop, New York.—p. 629.
An Apparatus for Macroscopic Cataphoresis Experiments. J. H. Northrop and G. E. Cullen, New York.—p. 635.
Stability of Bacteriol Suspensions. II. Agglutination of Bacillus of Rabbit Septicemia and of Bacillus Typhosus by Electrolytes. J. H. Northrup and P. H. De Kruif, New York.—p. 639.
Id. III. Agglutination in Presence of Proteins, Normal Serum, and Immune Serum. J. H. Northrop and P. H. De Kruif, New York.—p. 655.
Flocculation of Bacteria by Proteins. A. H. Eggerth and M. Bellows, Brooklyn.—p. 669.
Further Studies on Eosin Hemolysis. C. L. A. Schmidt and G. F. Norman, Berkeley, Calif.—p. 681.
Calibration of Osterhout Respiratory Apparatus for Absolute Quantities of Carbon Dioxide. G. H. Parker, Boston.—p. 689.
Studies in Physical Chemistry of Proteins. I. Solubility of Certain Proteins at Their Isoelectric Points. E. J. Cohn, Boston.—p. 697.
Cell Penetration by Acids. V. Note on Estimation of Permeability Changes. W. J. Crozier, New Brunswick.—p. 723.
Combination of Gelatin with Hydrochloric Acid. D. I. Hitchcock, New York.—p. 733.
Mechanism by Which Trivalent and Tetravalent Ions Produce an Electrical Charge on Isoelectric Protein. J. Loeb, New York.—p. 741.
Ionizing Influence of Salts with Trivalent and Tetravalent Ions on Crystalline Egg Albumin at Isoelectric Point. J. Loeb, New York.—p. 759.
Influence of Aggregates on Membrane Potentials and Osmotic Pressure of Protein Solutions. J. Loeb, New York.—p. 769.

Journal of Metabolic Research, Morristown, N. J.

April, 1922, **1**, No. 4

*Nutritional Factors in Growth of Yeasts and Bacteria. I. Vitamins. L. Freedman and C. Funk, New York.—p. 457.
Comparison of Nitrogenous Metabolism During Single and Fractional Feedings. A. Chanutin and L. B. Mendel, New Haven, Conn.—p. 481.
*Trial of Eucalyptus Infusion in Diabetes. H. J. John, Morristown.—p. 489.
*Glucose Tolerance and Its Value in Diagnosis. H. J. John, Cleveland.—p. 497.
Improved Alimentary Glucose Tolerance Test. C. Beeler, A. W. Bryan, E. P. Cathcart, R. Fitz, Rochester, Minn.—p. 549.

Nutritional Factors in Growth of Yeasts and Bacteria.—Freedman and Funk assert that with these substances in their natural mediums there are present in beef and beef heart infusions, peptone and autolyzed brewers' yeast, certain substances which show a strong growth stimulating activity on both hemolytic streptococci and yeast cells. These substances can be extracted from their natural sources by shaking with certain adsorbents, such as fullers' earth and norit charcoal, and can be recovered by extracting the absorbents with baryta and acetic acid, respectively. The properties of these substances show them to be of a vitamin-like nature; and they are either identical with the vitamin D described by Funk and Dubin or are of a similar nature. There is also present in beef and beef heart infusions another substance which is necessary for the growth of hemolytic bacteria, and this substance is thought to be associated with hemoglobin.

Eucalyptus Infusion in Diabetes.—John states that the infusion of eucalyptus leaves has no influence on diabetes. These negative observations under accurately controlled conditions will serve to overthrow the former claims of clinical benefits. It still stands as a fact that no drug has ever been found to possess any specific action on diabetes.

Diagnostic Value of Glucose Tolerance.—The sugar analyses of blood and urine made by John in a series of varied cases show gradation of assimilation which may be designated as (1) strong normal, (2) normal, (3) weak normal or prediabetic, (4) diabetic. With all possible allowances for uncertainties presented by renal glycosuria, toxic or infectious states, or other endocrine disorders, the simple glucose test revealed many cases of early or latent diabetes, in which prophylactic dietary regulation is a rational procedure. Studies of the largest possible numbers of such cases over the longest possible period of time will be necessary to establish their progress with certainty, but it seems probable that many cases of diabetes may be prevented by diet instituted on the basis of glucose tolerance tests in the prediabetic stage.

Maine Medical Association Journal, Portland

July, 1922, **12**, No. 12

Observations on Practice of Medicine. E. E. Brown, Bangor.—p. 355.

Minnesota Medicine, St. Paul

July, 1922, **5**, No. 7

Surgical Treatment of Goiter. A. Schwyzer, St. Paul.—p. 397.
Treatment of Empyema. A. C. Barker, Fergus Falls.—p. 399.
*Thyroid Therapy. R. G. Allison, Minneapolis.—p. 404.
Next Step in Control of Tuberculosis. R. Bosworth, St. Paul.—p. 409.
Surgery in Perforation of Typhoid Ulcer. F. C. Schuldt, St. Paul.—p. 414.
Chloroform Anesthesia. P. F. Holm, Wells.—p. 419.
Thyroid and Its Relationship to Nervous and Mental Symptoms. C. R. Ball, St. Paul.—p. 423.

Thyroid Therapy; Roentgen Ray.—Of twenty-seven cases of exophthalmic goiter without complications which were subjected to roentgen-ray treatment by Allison, twenty-four patients are well, both from the clinical and laboratory standpoint. The treatment has been complete for nearly eight months. The remaining three cases came to operation. Of these three, one was definitely improved before operation and the other two were normal a few months after operation. Of six cases of postoperative hyperthyroidism, which had relapsed, one showed a definite cure. The other five showed no improvement. Of three cases of thyrotoxic adenoma none showed any response to roentgen-ray therapy. The only patient operated on during an increasing basal metabolic rate died an operative death. No bad results or complications have occurred.

South Carolina Medical Association Journal, Greenville

July, 1922, **18**, No. 7

Acute Osteomyelitis in Children. G. H. Bunch, Columbia.—p. 185.
Aortic Insufficiency. J. F. Woods, Charleston.—p. 188.
Sacral Anaesthesia. J. J. Ravenel, Charleston.—p. 190.
Abdominal Migraine. R. P. Finney, Gaffney.—p. 192.
Gastrogenic Diarrhea. G. M. Niles, Atlanta.—p. 193.

Southern Medical Journal, Birmingham, Ala.

July, 1922, **15**, No. 7

*Diagnosis of Pulmonary Tuberculosis. L. Hamman, Baltimore.—p. 523.
*Teaching of Infant Feeding. W. McK. Marriott, St. Louis.—p. 530.
*Classification of Birth Paralyses as Endocrines. L. B. Clarke, Atlanta, Ga.—p. 534.
Endocrines in Children. W. W. Harper, Salem, Ala.—p. 536.
*Diverticula of Esophagus. C. G. Lucas, Louisville, Ky.—p. 542.
Significance and Diagnosis of Cardiac Anginal Pains. D. D. Paulus, Oklahoma City, Okla.—p. 545.
*Pellagra in Young Child. R. A. Strong, Pass Christian, Miss.—p. 550.
Summer Peak of Infant Mortality in South Carolina, 1921: Preventive Measures Instituted. E. A. Hines, Seneca, S. C.—p. 552.
Plastic Operations for Defects Due to Noma. J. S. Horsley, Richmond, Va.—p. 557.
Eclampsia and Pre-Eclamptic Conditions. G. H. Lee, Galveston, Tex. —p. 561.
More Common Causes of Chronic Urinary Obstruction in Male Children. W. A. Frontz, Baltimore.—p. 570.
Frequently Violated Principles in Obstetrics. W. A. Fowler, Oklahoma City, Okla.—p. 577.
Glaucoma Following Cataract Extraction. W. Ralston and E. L. Goar, Houston, Tex.—p. 581.
Increasing Importance of Peroral Endoscopy. T. E. Carmody, Denver. —p. 585.

Diagnosis of Pulmonary Tuberculosis.—The results of treatment in pulmonary tuberculosis, Hamman states, vary directly with the earliness of diagnosis. This imposes on the physician the duty to be ever alert to the early manifestations of the disease. Unfortunately, the natural progress of the infection makes it impossible for him to detect all instances of the disease at an early stage, for many pass at a stroke from health to an advanced stage. In those instances beginning in a more gradual fashion accurate diagnosis requires all the means of investigation that the physician can summon to his aid. Not the history alone, nor the physical examination alone, nor the roentgen ray alone, nor the sputum alone, nor tuberculin alone, can solve the problem. He who uses one of these methods to the exclusion of the others is sure to come to grief. Indeed, with all of them at hand final judgment is frequently difficult and sometimes impossible. The great obstacle in the way of satisfactory early diagnosis is the prevalence of tuberculous infection. There is as yet no way to distinguish in the large group of infected those about to develop manifest tuberculous disease.

Infant Feeding.—There is a science of infant nutrition, says Marriott, and a few simple foods, such as sweet and sour milk, milk curds and sugar, comprise the entire useful armamentarium. The indications for the use of these are simple and readily understood by any one. The apparently brilliant results from various unusual and complicated formulas can always be explained on the basis of the underlying principles and could have been accomplished just as well by simpler means.

Birth Paralyses Are Endocrinous.—Many cases showing mental or physical deficiency and birth paralysis Clarke asserts are due to disordered functions of the ductless glands. No case showing mental or physical deficiency should be dismissed as hopeless until it has been definitely established that it does not belong to this group. Early recognition followed by early and thorough treatment is necessary if the best results are to be obtained.

Diverticula of Esophagus.—Lucas reports two cases, in one a large diverticulum was found in the lower third of the esophagus, and in the other a small diverticulum, about the size of a twenty-five cent piece, was found in the cervical portion of the esophagus behind the cricoid cartilage on the right anterior wall.

Pellagra Not an Infection.—In Strong's case spinal fluid was injected into two monkeys but the results were negative after eight months' observation on the monkeys.

FOREIGN

An asterisk (*) before a title indicates that the article is abstracted below. Single case reports and trials of new drugs are usually omitted.

British Medical Journal, London

July 8, 1922, **2**, No. 3210

*Problem of Radium Therapy of Cancer. A. Burrows.—p. 33.
Surgical Treatment of Chronic Ulcer of Body of Stomach. W. Billington.—p. 34.
Deep Therapy. C. C. Anderson.—p. 36.
*Results of Treatment in Syphilis of Central Nervous System. R. Hearn. —p. 37.
*Treatment and Prognosis of Leprosy. P. Harper.—p. 39.
Simple Portable Apparatus for Continuous Oxygen Administration. G. Bourne.—p. 40.
Treatment of Psoriasis by Manganese. J. Moore.—p. 41.
Zinc Ionization as Disinfectant in Local Sepsis Illustrated by Use in Chronic Otorrhea in Children. A. R. Friel.—p. 42.

Radium Therapy for Cancer.—Burrows asserts that 7.5 per cent. of all the cancer patients (mostly inoperable) who have come to Manchester for radium treatment are alive and well today after periods varying from two to seven years, and many patients with carcinoma of the cervix of the uterus, breast, skin, lip and other regions are in perfect health who would, but for radium, be dead; while endothelioma of the parotid gland and spindle cell sarcomas show still more gratifying results. Moreover, short of cure much valuable palliative work is done, while in nonmalignant conditions, such as exophthalmic goiter, Hodgkin's disease (when young), keloid, cavernous and capillary nevi, the percentage of cures is high; finally, radium is specific for excessive uterine hemorrhage and spring catarrh.

Syphilis of Central Nervous System.—One hundred cases of syphilis of the central nervous system are reviewed by Hearn. It appears that a man is much more likely to develop nervous syphilis if his primary sore is of the papulo-erosive type. In the 100 cases under review, sixty-four showed no trace of any scar; thirty-three showed the slight and almost invisible type of scar which follows a papulo-erosive chancre when it leaves any scar at all; two showed scars typical of a papulo-ulcerative chancre and in only one case did the scar prove that the original sore was a primary granulating chancre. The smaller and the more transient the original sore, the more likely is the patient to develop a nervous manifestation in later years. Seventeen cases were of the meningeal, interstitial, or late secondary type, and of these two were definite "neurorecurrences" following the use of arsphenamin. As the result of treatment, all these patients were restored to normal health, so far as could be determined both by clinical and pathologic means. However, patients who complained of tinnitus aurium never lost this distressing symptom. Degenerative or parenchymatous cases were materially benefited by treatment, so far as subjective symptoms were concerned. Eighty-three cases were treated, but in no instance was it found possible to bring about any alteration in the physical signs, or to effect any permanent improvement in the pathologic picture presented by the cerebrospinal fluid. The condition of the cerebrospinal fluid was found to be of no value in deciding whether a patient suffering from degenerative neurosyphilis should be treated. In contradiction to the generally accepted view, general paretics were improved, and the onset of insanity postponed, provided that they were brought under treatment before they had become obviously stupid and fatuous. When the latter stage was reached treatment was worse than useless and only accelerated the fatal termination.

Mortality of Leprosy.—In the first 157 deaths at Makogai, tuberculosis (forty-two) and sepsis (three) were the chief causes of death. Only fourteen patients died of leprosy. In many cases, Harper says, leprosy actually prolongs life, for if a man contracts the disease he orders his life sanely with the idea of combating not merely his leprosy but also the possibility of other diseases and vices.

July 15, 1922, **2**, No. 3211

*Process Which Results in Auricular Fibrillation. J. Mackenzie.—p. 71.
*Bone Grafting as Aid in Treatment of Tuberculous Spinal Caries. H. M. W. Gray.—p. 73.

Tendon Transplantation. R. Ollerenshaw.—p. 77.
*Value of Complement Fixation Test in Pulmonary Tuberculosis. A. L. Punch, L. and A. H. Gosse.—p. 79.
*Pathology of Fetal Maceration. G. I. Strachan.—p. 80.
Recovery of Vision After Incipient Panophthalmitis Following Cataract Extraction. H. Kirkpatrick.—p. 82.

Mechanics of Auricular Fibrillation.—Mackenzie discusses the mechanics of auricular fibrillation, a term which, he asserts, is not descriptive because the fibrillation is a result and not a cause. It would be more appropriate to describe the condition by the process which produces it, and in a sense the term "auricular paralysis" might be employed, seeing that it resembles paralyzed muscle. Fibrillation of a muscle results when it is uncontrolled by the motor nerve. There seems to be a law which governs the activity of muscles, in that so long as a muscle is under control of the nervous system, fibrillation does not occur. In the case of the ordinary muscles it is the nerves which exercise the control. The same law holds good for the heart, but in the case of the heart muscle it is the sino-auricular node and conducting system which exercise the control.

Bone Grafting for Tuberculous Spine.—Gray does not think that bridging the tips of the spinous processes of the vertebrae, as is done in Albee's operation, gives sufficient fixation, as there must be a certain amount of "give" in these spinous processes and grafts, at all events in the dorsal region, where the disease is most frequently situated. Fixation of the diseased part seems to be rather uncertain owing to the graft being inserted at such a distance from the articular process and intervertebral discs where movements can occur. Gray believes that this inadequate fixation is the cause of some of the unsatisfactory results following this operation, especially in younger children. In Hibbs' most recent method, if a continuous column of bone is formed between the laminae as well as between the spinous processes, fixation must be good, but the operation seems to be needlessly complicated and severe and not likely to be so uniformly successful as the operation Gray practices—the implantation of tibial transplants into grooves made in the spine. The periosteum of the spines and laminae is incised and reflected upward and downward off the outer and posterior aspects of these structures. The exposed bone is roughened by making small irregular incisions with a chisel and raising the edges of these incisions. The grafts are placed so that their periosteum is outermost. The edges of the aponeuroses are approximated across the midline by catgut sutures and the wound is closed without drainage. The pressure of the muscles and dressings is usually enough to keep the grafts in place.

Value of Complement Fixation Test in Pulmonary Tuberculosis.—Punch and Gosse have previously shown that a positive complement fixation test is obtained in 98 per cent. of cases with tubercle bacilli in the sputum. They have subsequently collected evidence which suggests that this small error of 2 per cent. occurs in cases of very sudden onset and running a very rapid course, in which presumably the tubercle bacilli are so virulent and the invasion so massive that those cells of the body which are responsible for the production of the complement fixing substances are overwhelmed with toxins and unable to respond to the call made on them. In the rare cases in which, with symptoms due to tuberculosis, the test is negative at first but later becomes positive, it is reasonable to assume that a sufficiently long interval has not elapsed from the time of infection for the complement fixing substances to be developed. In a series of controls consisting of healthy persons or patients suffering from diseases other than tuberculosis the test was negative in 98.5 per cent. In a series of fifty cases with symptoms strongly resembling those of pulmonary tuberculosis, and sometimes even with apical signs, giving a negative result to the test, forty-nine showed no further evidence of tuberculous infection from ten to twenty months later.

Pathology of Fetal Maceration.—Strachan contends that maceration is the result of retention of the dead fetus into utero whatever be the cause of the death. Maceration alone is no sign of the presence of syphilis. In the investigation of any macerated fetus, it is essential to have the placenta for examination also. The bony changes in any macerated fetus bear a superficial resemblance to the chondro-epiphysitis of syphilis and have to be differentiated carefully. The microscopic findings indicate a process of autolysis of the constituent cells of the various organs with edema of the interstitial tissue and extrusion of red blood cells. In the syphilitic cases the placenta will be thick and pale, while in the other cases hemorrhages and infarctions will often be present.

British Journal of Surgery, Bristol

July, 1922, **10**, No. 37

Eponyms: D'Arcy Power.—p. 1.
*Removal of Intrathoracic Tumors by Transsternal Route. T. P. Dunhill.—p. 4.
*Late Results of Manipulative Treatment of Congenital Dislocation of Hip. E. L. Evans.—p. 15.
*Late Results of Treatment of Congenital Dislocations of Hip. H. A. T. Fairbank—p. 24.
Acute Phlegmonous Gastritis: Report of Case. C. J. MacAuley.—p. 38.
*Tuberculous Chancre. J. A. Nixon and A. R. Short.—p. 44.
Plastic Repair of Face and Hand. J. J. M. Shaw.—p. 17.
*Osteo Arthritis: Principles Underlying Its Surgical Treatment. A. G. T. Fisher.—p. 52.
Pharyngeal Diverticulum and Its Surgical Treatment: Record of Two Cases. D. P. D. Wilkie and J. N. J. Hartley.—p. 81.
Remote Effects of Gunshot Wounds of Head L. B. Rawling.—p. 93.
Early Signs and Symptoms of Cholelithiasis. B. Moynihan.—p. 127.
Comparison of Cholecystostomy and Cholecystectomy. J. Sherren.—p. 135.
*Torsion of Hydatid of Morgagni. A. J. Walton.—p. 151.
Case of Primary Jejunal Ulcer. A. J. Walton.—p. 152.
*Large Ureteral Calculus. P. M. Heath.—p. 153.
*Curious Hernia. D. C. L. Fitzwilliams—p. 155.

Removal of Intrathoracic Tumors by Transsternal Route.—In the three cases cited by Dunhill the tumors were removed through an incision which split the upper half of the sternum. Urgent necessity compelled intervention, unless the patients were to be left to their fate. The difficulty of respiration had reached a degree which, in the first case, was incompatible with exertion; and in the other two cases was rapidly becoming incompatible with life. The first case was one of intrathoracic fibroma of unusually large size weighing 1 pound 3½ ounces. Cases 2 and 3 were intrathoracic enlargements of the thyroid.

Treatment of Congenital Dislocations of Hip.—Evans is of the opinion that no surgeon should attempt the treatment of a congenitally displaced hip unless he is able to obtain roentgen-ray proof of treatment of his positions in plaster, and of the subsequent growth of the acetabulum and upper end of the femur, and unless he has had considerable opportunity of observing the methods and results of others. In this way only can the percentages of successes be increased. He analyzes his results in forty-nine cases.

Manipulation Treatment of Congenital Dislocation of Hip.—Fairbank says that an anatomic cure ought to be obtained by manipulative reduction in about 75 per cent. of the unilateral and 50 per cent. of the bilateral cases. In the vast majority of these the function should be excellent, at any rate for many years. Of those giving an imperfect result by the manipulative method, some additional "cures" should be obtained by a second manipulative reduction, followed in two or three weeks' time by open operation, the object of which is the making of an upper lip for the acetabulum without opening the joint. This Fairbank regards as a much less grave operation than open reduction. Open reduction should not be necessary in the younger cases, but is specially to be considered in those cases of the middle age group in which manipulative reduction has proved impossible. Only in carefully selected cases should this operation be performed after the age of 6 years. After reduction, full right angle abduction should be maintained for a minimum of six months. Physical treatment after removal of the plaster cast, in all but the youngest patients, may exert a permanent influence on the function of the hip, but it probably has no effect on the anatomic result.

Tuberculous Chancre of Skin.—There is a variety of tuberculosis of the skin which so closely resembles a primary syphilitic sore that, on the rare occasions when it occurs, it is likely to be diagnosed as extragenital chancre. These primary tuberculous ulcers are probably due to inoculation of tubercle bacilli into persons who have a latent tuberculous infection. Their tissues become intolerant to the presence of

the bacilli. The ulcer at the site of a subsequent inoculation represents the efforts of the tissues to expel the bacilli by local necrosis where they have lodged. The diagnosis of tuberculous chancre can only be made by excising part, or the whole, of the ulcer and examining the tissue for tubercle bacilli, either by staining or, if this proves negative, by animal inoculation. A negative result, Nixon and Short state, should never be accepted without animal inoculation. To illustrate the character and behavior of this form of tuberculous lesion they report four cases. One patient had a pimple on her chin; the second had an ulcer over the middle of the right patella; the third had a small hard tumor on the conjunctiva in the fornix at the external canthus, with swelling of the lids and general injection; and the fourth had a red proliferating growth, about the size of a filbert, extending from the filtrum of the nose to the border of the lip, and slightly overhanging the lower lip.

Treatment of Osteo-Arthritis.—The general principles of treatment which are particularly applicable to the earlier and active stages of the disease, and for the infective or toxic group, including the "senile" variety laid down by Fisher are: (1) Eradication, as far as possible, of any focus or foci of toxic absorption, including measures that prevent the formation or assist the elimination of systemic toxins. (2) The cessation, particularly in uniarticular cases and in the lower extremity, of pressure between diseased articular surfaces. (3) Local treatment to the joints themselves to stimulate defensive reaction of articular elements, and to prevent ankylosis. (4) Dietetic and medicinal treatment.

Torsion of Hydatid of Morgagni.—Walton reports what he asserts is the third case of the kind. It occurred in a boy, aged 13, who noticed a sudden onset of severe pain in the left testicle while at school. He did not vomit, and his bowels were moving regularly. The pain persisted that night. An emergency operation was performed in the belief that the condition was one of torsion of the testicle. On opening the tunica vaginalis a large, swollen hydatid of Morgagni was seen. It was attached to the outer side of the testicle, and there was a pedicle about a quarter of an inch long which was twisted in two complete revolutions. There was no mesentery between the testicle and epididymis, and no evidence of torsion of the cord. The tunica vaginalis was sutured, the testicle replaced, and the wound closed.

Large Ureteral Calculus.—Heath's specimen measured 6 inches in length, was 1 inch in diameter and weighed 1,075 grains, or 65.8 gm.

Appendix Epiploica Herniated.—Fitzwilliams cites the case of a man, aged 50, who had double inguinal hernias which were operated on in 1913. A year later both had recurred, and he had worn a truss since then. The right side had always been worse than the left, and gave him much trouble, as the truss did not control it. At the operation the sac was laid bare, quite black, and obviously containing something, and that something black, strangulated and dead. The neck of the sac was right up against a piece of large intestine, and the long process in the sac was at first thought to be a appendix, though on the left side of the body. On cutting it open, the mass was found to have been an enormously enlarged appendix epiploica, which had been attached to the sigmoid colon. The symptoms were not those of strangulation, except for the fact that there was no impulse on coughing. The bowels moved well after castor oil. Symptoms of very acute sciatica down the left leg were evidently the reflected pain from the sigmoid colon. The symptoms corresponded exactly to those found both in Littre's and in Richter's hernia. This curious form of hernia might justly be classified as a third form of hernia involving the bowel in which the lumen of the bowel is not obstructed.

Irish Journal of Medical Science, Dublin

June, 1922, Series 5, No. 4

Intrathecal Tumor of Cervical Spinal Cord. W. Pearson.—p. 145.
Treatment of Diphtheria by Antitoxin. H. C. Drury.—p. 153.
Treatment of Some Acute Infections. W. Crofton.—p. 159.
Two Fatal Cases of Erysipelas Associated with Streptococcal Septicemia. J. H. Pollock.—p. 172.

Lancet, London

July 15, 1922, 2, No. 5159

*Clinical Symptoms of Cerebellar Disease. G. Holmes.—p. 111.
*Experimental Bases of Theory of Gangrena Arteriitica Suprarenalis. V. A. Oppel.—p. 116.
*Alcohol Injection in Facial Neuralgia. W. Harris.—p. 122.
*Venous Angeioma of Cerebral Cortex: Report of Case. C. Worster-Drought.—p. 125.
*Intestinal Flora: As Revealed by Use of New Culture Medium. D. C. Watson.—p. 127.

Clinical Symptoms of Cerebellar Disease.—Holmes' observations do not lend support to the theory of circumscribed functional representation of different parts of the body in the lateral lobes. He has invariably found that the symptoms produced by a small lesion were never limited to one limb or a segment of a limb; that if any abnormality could be detected in the arm, the leg was affected too, and that there was very frequently in addition some disturbances in the functions of the cranial nerves. In a certain number of cases, however, the one limb seemed to be relatively more affected than the other, the leg being more involved by caudal and mesial lesions, and the arm by the more anterior lesions. It is possible, then, Holmes thinks, that there is a "prevalence of representation" in Rossi's sense, the arm being represented more anteriorly and the leg more posteriorly, but this localization is so indefinite that he would not regard it as a trustworthy guide in the diagnosis of a small lesion, such as cortical tumor. Two clinical facts are brought out by Holmes' observations that tend to invalidate many of the schemes of cortical localization that have been put forward. In the first place, Bolk and many of his followers have claimed that the ocular movements are represented in the lobus anterior or superior vermis, but, Holmes has observed nystagmus or other disturbances of the ocular movements in practically all local lesions, no matter what their situation was. In the second place, Bolk placed the representation of the organs of phonation and articulation in the lobus anterior, and Rothmann and Katzenstein and others have described a cortical center for the larynx here, too, but in Holmes' experience speech may be affected by lesions of any portion of either the vermis or lateral lobes, though it is more liable to be severely disturbed when the vermis is injured. These observations consequently lend no support to a circumscribed or focal representation of different portions of the body in the cortex of the cerebellum, apart from the fact that the vermis is concerned mainly with movements requiring the cooperation of muscles on the two sides of the body, and the lateral lobes mainly with the functions of the homolateral limbs.

Cause of Suprarenal Arterial Gangrene.—In 1921, Oppel suggested that so-called idiopathic gangrene is the result of excessive activity of the suprarenal glands. In gangrena arteriitica suprarenalis one not infrequently observes a spasm of the arteries causing complete blanching of the fingers—i. e., a spasm up to 100 per cent., with ischemic pains, etc., and this spasm must be ascribed to a comparatively trifling increase in the quantity of epinephrin in the blood of such patients. Oppel asserts that in human pathology, in suprarenal arterial gangrene, the concentrations of epinephrin must be less than 1 : 100,000,000, for concentrations of approximately 1 : 80,000,000 cause ischemic paralyses, which, if such concentration were maintained, would rapidly end in gangrene of the limb, and not even of one limb but of all four simultaneously. Clinically, nothing of the kind is seen. In human pathology, the hyperepinephrinemia assumed to exist only gradually disturbs the nutrition of the arterial walls in the first instance, resulting in a series of pathologic changes in them and in the contained blood. Hyman hyperepinephrinemia can be detected in an increase of the vasoconstrictor effect of the blood serum of so-called spontaneous grangrene cases. But, in separated ears and fingers, which have lost some of the sensitiveness, the conditions are too rough for the detection of hyperepinephrinemia in the blood plasma. Clinically, the result of treatment of so-called spontaneous gangrene cases by excision of the left suprarenal, on the one hand, and the pathologic anatomic data on the other, support Oppel's thesis.

Alcohol Injection in Facial Neuralgia.—Strong alcohol, being a tissue fixative, coagulates the albuminous elements of the nerve fibers and dissolves the fatty sheath of Schwann. Degeneration downward of the nerve, then, results from the

point of injection, and the process has been termed neurolysis. Regeneration of the nerve fiber occurs in the ordinary course, and may be more or less complete in two years. In Harris' experience, sensation never returns so fully in the third division as after injection of the second division. Freedom from the neuralgia may practically be guaranteed for twelve months, if the nerve has been properly hit, and in the majority of his cases the immunity from pain has been much longer, ranging up to thirteen years in the case of third division neuralgia already referred to. Four and five years is a quite common period for the immunity to last. In many scores of cases in which Harris injected the gasserian ganglion there seems no reason why, in those with total anesthesia, the cure may not be as permanent as in cases of complete gasserectomy or resection of the sensory root behind the ganglion, though injection operation is indefinitely less severe, and is practically free from risk when done by an expert, though it is not an operation to be attempted until considerable experience of the method has been gained.

Venous Angeioma of Cerebral Cortex.—A man, aged 31, in 1916 began to experience occasional attacks of "tingling" on the left side of the face. After four months each attack was followed by transient loss of consciousness; this in turn was succeeded by powerlessness in the left arm and leg. The attacks continued to occur at intervals of about four weeks, and finally led to his being admitted to a hospital. He improved and returned to duty for a few weeks, but relapsed and was invalided from the navy as a case of (?) disseminated sclerosis in March, 1917. The attacks continued to occur at irregular intervals to 1920, when the authors saw him. A diagnosis of "lesion (? nature) of the rolandic area of right cerebral cortex, with Jacksonian epilepsy" was made. Fifteen months later he was getting out of bed when a "shivering attack" occurred, and the left arm and leg became useless. When seen a few minutes later, he appeared semi-stuporous and exhibited a flaccid paresis of the left arm and leg; the pupils reacted to light, there was no squint, reaction occurred to pin pricks applied to the left arm and leg, and the left plantar reflex was extensor. Five minutes later consciousness was normal, but the patient said the left arm felt weak and numb and the tongue seemed swollen. As the lesion appeared to be progressing, although very slowly, it was decided to explore the right rolandic area. The dura was tense, dark and thin, and large veins were the apparent cause of the bulging of the membrane. The dura was opened and on being reflected the whole of the cortical area exposed by the removal of the piece of bone was found to be occupied by enormous veins, the arachnoid being stretched over them; some of these veins were of a size almost of the little finger. The walls of the veins appeared very thin and at several points were adherent to the dura mater. Owing to their large size and to the fact that all disappeared beneath the margins of the bone bounding the opening, no attempt could be made at separation for removal. A celluloid plate was cut to fit the opening in the bone and fixed in position with small tacks. Five months after operation, no definite seizures had occurred; on four occasions only he has experienced slight numbness of the left arm and hand, passing to the left side of the face. The physical signs remain practically as before, excepting that no left-sided facial weakness is demonstrable and the left arm and leg appear stronger. The features in the case worthy of note are: (1) sensory aura beginning in the face; (2) absence of any change in cutaneous sensibility; (3) absence of optic neuritis; (4) extremely large size of the veins forming the angeioma; (5) marked improvement following operation—presumably due to relief of local pressure.

New Culture Medium for Intestinal Flora.—In his studies of intestinal bacteria Watson uses a saccharose milk agar medium. The broth (using bullock's heart) is made as follows: meat extract, 1,000 c.c.; peptone, 10 gm.; sodium chlorid, 5 gm. This is evaporated down to one-fifth original bulk and made up to original bulk with whole milk. Two per cent. saccharose are added after the medium has been neutralized with tenth normal sodium hydroxid solution. By the use of this medium it was found that in contrast to all the mediums in common use for primary culture, the growth of gram-positive organisms, mainly of streptococcal form, increases from an average of 5 per cent. or less up to an average of 45 or 50 per cent. The use of this saccharose-milk-agar medium provides a film which compares favorably with the original smear.

Medical Journal of South Africa, Johannesburg

May, 1922, **17**, No. 10

*Typhus: Its Infectivity and Value of Weil-Felix Reaction in Diagnosis. J. H. H. Pirie.—p. 197.
Therapeutic Artificial Pneumothorax. D. P. Marais.—p. 200.
Toxemias of Pregnancy: Evolution as Etiologic Factor. S. E. Kark, Edinburgh, Eng.—p. 207.

Value of Weil-Felix Reaction in Typhus.—Pirie has found the Weil-Felix reaction of considerable value as an aid in the diagnosis of typhus. Only agglutinations in dilution of 1:50 and upward should be accepted as definitely diagnostic typhus. Agglutinations in lower dilutions may be suggestive if in keeping with the clinical features, and call for a further test in a few days' time. The test may be positive on the fifth day, but is usually not so until the second week. The strongest reactions may be expected about the twelfth or fourteenth day. A positive reaction may persist for a few weeks, or at most a few months, after recovery. Typical cases may never develop a positive reaction, so that no stress should be laid on a negative reaction if the clinical features justify the diagnosis.

Archives Médicales Belges, Liége

April, 1922, **75**, No. 4

Epidemic Encephalitis in Belgium. L. van Boeckel and Bessemans.—p. 273.
Research on Colon Bacillus in Water. A. Hennekinne.—p. 314.
Chronic Infections of Lower Genito-Urinary Passages in Man. M. Devroye.—p. 322.

May, 1922, **75**, No. 5

*Spirochaeta Pallida in Sperm. R. Lakaye.—p. 385.
Syphilis in Mental Disease. H. Hoven:—p. 393.
Disturbances Due to Changes in Organic Chemistry. E. Delcourt-Bernard.—p. 410.

Spirochaeta Pallida in Sperm.—In 1920 Lakaye began to study the possibility of the transmission of spirochetes by the sperm, and a little later Pinard and Hoch reported having found *Spirochaeta pallida* in 3 of 11 specimens of human sperm. His further research confirmed theirs. Besides his microscopic research, he inoculated the anterior chamber of the rabbit eye with human sperm, obtained by massaging the seminal vesicles after injecting 200 c.c. of physiologic saline into the bladder. *Spirochaeta pallida* was found in 5 of 22 specimens examined. In one case the spirochete was attached to the tip of the spermatozoon head by one end and to the middle piece by the other end. In another case, half the spirochete clung to the middle of the tail, the other half floating free. Of the 22 inoculation experiments, a positive result was obtained in 9 and negative results in 10. The spirochete was refound in only 2 instances. There was suppuration in 3 of the rabbit eyes. Carle states that the mother giving birth to a syphilitic child is always syphilitic, although seemingly in perfect health. It often happens, however, that these women reexamined in the course of several years will not present any signs of syphilis, and that the seroreaction will remain negative.

Bulletins de la Société Médicale des Hôpitaux, Paris

May 26, 1922, **46**, No. 18

Glanders in Man; Two Cases. Said Djémil.—p. 820.
*Vaccine and Serotherapy of Bronchopneumonia. D'Oelsnitz and Colle.—p. 822.
*Enrichment of Sputum by Incubation. S. I. de Jong and P. Hillemand.—p. 828.
Neuralgic Form of Osteitis. Hallé.—p. 832.
*Comparative Value of Condensed Milks. G. Variot.—p. 838.
*Bleeding Time with Liver Disease. P. E. Weil et al.—p. 844.
*Tongue Sign of Bulbar Lesion. A. Ricaldoni.—p. 850.

Vaccine-Serotherapy of Pneumonia.—The leukocyte reactions in the course of this treatment were recorded in thirty cases of bronchopneumonia, including 8 adults. The leukocyte curve enabled better oversight of the course than is possible from clinical examination alone, although no regular laws could be detected.

Enrichment of Sputum by Incubation.—Tuberculous sputum in a test tube set in the incubator for four days at 37 C. separates into two layers. The upper, fluid layer contains

few bacteria, as they have all settled down in the lower layer. With this enrichment method tubercle bacilli may be found from ten to twenty times more numerous than in the same sputum examined without incubation. About 2 c.c. of the sediment is treated with 5 c.c. of 2 per cent. sodium hydroxid, and heated; then 10 c.c. of water is added and then 2 c.c. of alcohol. The whole is centrifuged for thirty minutes and then spread and stained. Comparative tests with other methods of enrichment showed that this technic enabled homogenization to be dispensed with as a rule. When homogenization was positive, the enrichment procedure gave positive findings. Only in two of the total 120 specimens examined was homogenization positive when the other tests had been negative.

Condensed Milk in Infant Feeding.—Variot here reports the results of eight years of critical study of different kinds of condensed milk and the effects in infant feeding. The unsweetened condensed milks are heated to such a high temperature that the accessory food factors are destroyed completely. This renders them unfit for infants, and scurvy is not the only ill effect of their use. Adults can make up the vitamins from their other food, but infants suffer from the lack of them. On the other hand, infants brought up on sweetened milk evaporated at 50 C. developed normally, other things being equal. His experience with 5,000 infants confirms that scurvy need not be feared with this class of sweetened condensed milk.

Bleeding Time in Liver Disease.—The bleeding time is recorded in this article in about 100 cases of different kinds of liver affections. With insufficiency of the liver, the composition of the blood differs from normal in certain respects, and this is revealed most readily by the change in the bleeding time. Instead of the normal three minutes, the bleeding continues longer and the bleeding time is variable, and arrhythmic both in time and space. Positive findings in this respect are accompanied by cholemia, urobilinuria, cholaluria and the digestive leukopenia of Widal's hemoclastic crisis. The abnormal bleeding time is a very early and sensitive test of liver derangement. It returns to normal as soon as the liver functioning becomes normal. The bleeding time may be abnormal without any hemorrhagic tendency; hence the condition of the blood is not the only factor in hemorrhages.

The Babinski-Nageotte Syndrome.—Ricaldoni describes a typical case in a man, and calls attention to the hook shape assumed by the tongue when it was extended, hemihypermetria of the tongue.

Journal de Chirurgie, Paris

July, 1922, **20**, No. 1

*Surgical Anatomy of the Palate. V. Veau and C. Ruppe.—p. 1.

Surgical Anatomy of the Palate.—This long article with its thirty-three illustrations is preliminary to a description of a method for operating for cleft palate, which is to follow later.

Paris Médical

April 15, 1922, **12**, No. 15

Crenotherapy and Climatotherapy in 1922. G. Linossier.—p. 309.
*Radioactivity of Mineral Waters. Loisel.—p. 310.
*Crenotherapy and Shock Phenomena. J. Galup.—p. 314.
Action of Natural Carbonated Baths. J. Heitz.—p. 319.
Physical Bases for Heliotherapy. A. Rosselet.—p. 325.

Radioactivity of Mineral Waters.—Loisel gives a table of the amount of radium emanation found in the mineral waters of the fifty more important mineral springs of France, as determined mostly by Curie, Laborde and himself. His own research at Bagnoles has demonstrated an additional radioactivity that differs from what is known hitherto, and must be due to some other radioactive element. He calls this hypothetic element emilium. The variations in radioactivity of a mineral spring throw light on its physiology, as it were.

Crenotherapy and Shock Phenomena.—Galup remarks that the old and tried treatment of disease by mineral waters was rather pushed into the background by the discoveries of Pasteur, as the whole of pathology seemed to revolve around infection. But crenotherapy is coming into its own again. The recent discoveries in anaphylaxis and colloidoclasis all emphasize the importance of the soil, the hereditary or acquired predispositions, the chronic conditions interrupted by acute episodes, idiosyncrasies, etc., which infection is unable to explain—all throw light on the action of mineral waters.

June 24, 1922, **12**, No. 25

Treatment of Psoriasis. L. Hudelo.—p. 525.
*Chronic Hallucinations from Thrombosis. G. Paisseau and P. Oury.—p. 531.
Radiologic Control of Intratracheal Injections. P. Claisse and J. Serrand.—p. 533.
Simplest Methods for Artificial Anus. V. Pauchet and G. Luquet.—p. 534.
*Radiopelvimetry. C. Guilbert.—p. 536.

Delirium from Chronic Thrombosis.—The man of 65 had long had swollen glands in the neck when chronic hallucination delirium developed. The mind became more and more impaired but no signs of cerebral lesion or hypertension could be discovered. Necropsy revealed that the internal carotid artery had been completely obliterated by a dense fibrous tissue over a stretch of 1 cm. The thrombus might possibly have been removed if its existence had been suspected.

Radiopelvimetry.—Guilbert compares what he calls the orthogonal with the stereographic method of investigation of the pelvis with the roentgen rays. The principle in both is the same, namely, the correction by geometrical projection of the errors from a conical projection. It is realized with the aid of a second plate.

July 1, 1922, **12**, No. 26

Cardiovascular Disease in 1922. P. Lereboullet and J. Heitz.—p. 1.
*Nonsyphilitic Arteritis of Jews. A. Gilbert and A. Coury.—p. 13.
Incomplete Rupture of Aorta. L. Gallavardin and L. Gravier.—p. 23.
*Pathology of the Blood in 1922. M. Leconte.—p. 27.

Obliterating Arteritis.—A similar but less comprehensive article on this nonsyphilitic thrombo-angeitis was reviewed recently, July 22, 1922, page 333.

Pathology of the Blood in 1922.—Leconte reviews under this heading the recent literature on anaphylaxis, colloidoclasis and other shock phenomena, hemophilia, hemogenia, leukemia, and hemorrhagic purpura from benzol poisoning. The greatest progress has been realized with emetin and with radiotherapy, the latter especially in Hodgkin's disease and erythremia.

Presse Médicale, Paris

June 24, 1922, **30**, No. 50

Surgical Treatment of Glaucoma. F. Lagrange.—p. 541.
*Transfusion of Blood for Quinin Intolerance. E. Keramopoulos.—p. 544.
*Spinal Drainage Without Lumbar Puncture. P. Pagniez.—p. 545.

Anaphylaxis to Quinin.—Keramopoulos reports from Smyrna a case in which the anaphylactic shocks that constantly followed treatment with quinin were finally arrested by transfusion of blood from the woman's daughter. All other known methods of desensitization had been tried and failed, but under intravenous injection of 20 c.c. of citrated whole blood, every two or three days for a month, the general health improved remarkably and quinin then could be given regularly.

Spinal Drainage Without Lumbar Puncture.—Pagniez summarizes the work of Americans in this line from Weed and McKibben in 1919 to Corbus and his co-workers in THE JOURNAL recently, and emphasizes its importance. Leriche's experiences with means to remedy the disturbances from hypotension in the cerebrospinal fluid were summarized in an abstract here, May 20, 1922, p. 1578. Lhermitte still more recently has called attention to the modification of polyuria and glycosuria in diabetics by lumbar puncture.

Revue Neurologique, Paris

January, 1922, **38**, No. 1

*Sensory Dissociations in Brain Disease. P. Marie and H. Bouttier.—p. 1. Conc'n, No. 2, p. 144.
Tumor in Splenium of the Callosum. G. Guillain.—p. 23.
Kyphoscoliosis as Early Manifestation of Syringomyelia; Two Cases. C. Foix and E. Fatou.—p. 28.
*Extrapyramidal Syndromes. III. Syphilitic Hemisyndromes. A. Wimmer.—p. 38.
*Psychiatric Import of a Cathedral Carving. P. Courbon.—p. 52.

Dissociation of Sensibility in Brain Disease.—Marie and Bouttier discuss the present status of opinion on the thalamus syndrome and cortical sensory syndrome, and the different ways in which, with a lesion in the cortex, sensibility may be dissociated. Nineteen cases are described to show the information as to the location of the lesion to be derived from the loss and persistence of different cutaneous and deep senses.

Extrapyramidal Syndromes.—In one of the cases described by Wimmer there was a striatal hemisyndrome, a syphilitic brain affection, and monoplegia left from poliomyelitis. In another case the striatal hemisyndrome was accompanied by paralytic dementia but the spinal fluid seemed to be normal.

The Zoopathic Hypochondriac in the Strasbourg Cathedral Frieze.—Courbon interprets the figure as representing a hypochondriac with hallucinations of animals. It dates from the thirteenth century.

February, 1922, **38**, No. 2

*Negative Kinesia Versus Inhibitions. L. Bard.—p. 121.
*Amyotrophic Lateral Sclerosis. G. Marinesco.—p. 161.
The Dentate Nucleus in Case of Catatonia. C. I. Urechia.—p. 171.
*Deformity of Head and Extremities. Usse, Grunberg and Degouy.—p. 175.

Mechanism of Arresting Actions.—Bard emphasizes the necessity for distinguishing between negative kinesia and inhibitions, and analyzes their nature.

Amyotrophic Lateral Sclerosis.—Marinesco seeks to throw light on the physical and chemical mechanism of the lesions of amyotrophic lateral sclerosis by his study of five cases.

Teratologic Asymmetry in Degenerate.—The woman of 54 was an imbecile, and hands, feet and head showed numerous malformations, remarkable by their asymmetry.

March, 1922, **38**, No. 3

*Oculoviscerocutaneous Motor Reflexes. D. Daniélopolu, A. Radovici, and A. Carniol.—p. 249.
Primary Tumor of Septum Lucidum. Souques, Alajouanine and J. Bertrand.—p. 270.
Familial Infantile Bulbar Paralysis. E. D. Paulian.—p. 275.
Minor Signs of Paresis of Interossei Muscles. C. Orzechowski.—p. 279.

The Visceral Reflexes.—This communication presents the results of research on the innervation of the viscera, and means to influence the latter by reflex action from the eyeballs, skin or elsewhere. These reflexes are most instructively studied in persons with a spinal cord tumor or other lesion shutting off the brain. One such paralyzed patient urinates four times a day and is continent. When he feels the necessity for voiding the bladder, he rubs the skin of the hypogastrium, and the urine flows at once. As the urine flows, the legs make involuntary movements. Spontaneous contraction of the legs is accompanied by a desire to urinate, as also compression of the eyeball. Six of these visceral motor reflexes could be elicited in this case. They could all be elicited faintly in normal subjects but were scarcely recognizable. A method for graphic recording of the findings is described for comparison.

Schweizerische medizinische Wochenschrift, Basel

April 6, 1922, **52**, No. 14

*Workmen's Homes. C. Flügge.—p. 337.
*Periodical Vomiting with Acetonemia. H. Iselin.—p. 340.
Treatment of Pulsion Diverticulum. A. Suter.—p. 342.
Exophthalmic Goiter at Mayo Clinic. M. E. Bircher.—p. 347.
Delirium from Lightning Stroke. L. Bischoff.—p. 349.

Workmen's Homes.—Flügge discusses the pros and cons of different kinds of workmen's homes, his verdict being in favor of a separate home with a garden to raise carrots, turnips, onions, tomatoes and berries—foods to supply variety and vitamins—but with no attempt to do actual farm work, raise potatoes, etc. Chickens and rabbits supply the necessary manure, with the human night urine. A garden 150 square meters in extent is ample under present conditions of labor. He refers to settlements planned in the vicinity of factories or mines, with a central playground and a fishpond. He advocates long leases rather than ownership of the home, as the size of the family varies so much from the crowded quarters when the children are young to the empty rooms when the brood take up homes of their own.

Periodic Vomiting of Children with Acetonemia.—Iselin reports another case in which the general anesthesia was probably responsible for the death of the child of 4½ who had been sent to the hospital on account of an attack of repeated vomiting with pain in the right flank, and the diagnosis of acute appendicitis, 13,300 leukocytosis, and acetonemia. The child died in cyanosis the day after the appendicectomy. This periodic vomiting with acetonemia is particularly hard to differentiate in mild cases like the one here described, but when there is the slightest doubt, no general anesthetic should be used. In this case the severe intestinal symptoms and the slight local findings might have warned of the true diagnosis. Hecker has noticed that these children are inclined to be intolerant of fat; there is lymphocytosis, and this becomes more intense during the attack. The child may vomit all it eats, eliminating acetone in breath and urine, growing rapidly weak, and rapidly recuperating. The attack may begin without known cause or may follow some error in diet, especially the eating of fat, or some emotion, or a tonsillotomy, a vermifuge, the eruption of teeth, etc. The tongue is not coated to the extent that would be anticipated from the other symptoms; it may become red and dry. The pulse is fast, the temperature usually subfebrile or subnormal. Treatment with alkalines improves and cures completely in a couple of days, as a rule. He has had four such cases in the last year, and now makes a practice of examining for acetone before operating for appendicitis. Necropsy findings in two cases have been published; in both there was severe fatty degeneration of the liver, which explains the harm from chloroform.

Pediatria, Naples

June 15, 1922, **30**, No. 12

*Intolerance for Breast Milk. S. Cannata.—p. 529.
Dispensary for Infants. F. de Angelis.—p. 537.
*Surgical Treatment of Infantile Paralysis. N. Caprioli.—p. 548.
*Diagnostic Import of Epitrochlear Adenitis. S. Fabbris.—p. 560.
Present Status of Purpura in Children. G. Genoese.—p. 564.

Intolerance for Mother's Milk.—Cannata protests against the assumption of anaphylaxis in explaining intolerance for breast milk, of which he describes two cases. Study of such cases usually reveals some overfeeding at first, or some congenital or acquired instability of the digestive tract. This entails chronic gastro-intestinal disturbance which yields only to a change to the milk of some other woman or artificial feeding.

Operative Treatment of Infantile Paralysis.—Caprioli remarks that the results are better the more intelligent the patient, as his cooperation is essential. No operation should be attempted as long as there is the least chance of improvement without it. Even in the gravest chronic forms, arthrodesis should not be resorted to until after failure of every possible intervention on the soft parts. Among the latter, tendon implants and transplants give the best results. He describes six cases to illustrate the different types of operations. The outcome was excellent in all six cases.

Diagnostic Import of Epitrochlear Adenitis.—Fabbris reported recently that inherited syphilis was manifest in 33 per cent. of the infants with epitrochlear adenitis that he had examined. He here reports that in over 1802 older children, epitrochlear adenitis was found in 71 per cent. of the 112 cases of active syphilis and in 63 per cent. of the 154 with latent syphilis; in 83 per cent. of the cases of syphilis plus tuberculosis, but only in 21 per cent. of the children with rachitis, in 26 per cent. of the 342 tuberculous children, and in 13.5 per cent. of the 909 with other affections.

Brazil-Medico, Rio de Janeiro

May 6, 1922, **1**, No. 18

*Experiences with Bacteriophagia. R. Kraus and P. Marrey.—p. 227.
Case of Schistosomiasis in Child of Two With Skin Manifestations. Martagão Gesteira.—p. 230.

Bacteriophagia.—Kraus and Marrey have found that the bacteriophagic action is evident in cultures of anthrax bacilli treated with filtrates of typhoid and dysentery stools. No action on blood corpuscles could be detected, but they found

that a certain amount of fermentation, coagulation and color changes occurred in certain culture mediums when treated with the bacteriophagic stool extracts, which were not observed in the nonbacteriophagic. This suggests that the bacteriophagum has other properties hitherto unnoticed, in addition to its bacteriophagia. Their research confirmed in every respect the statements of Twort and d'Herelle.

Crónica Médica, Lima, Peru

March, 1922, **39**, No. 705

Surgical Treatment of Spastic Torticollis. C. Morales Macedo.—p. 86.
*"Puericulture" versus "Nipiotechnic." R. Eyzaguirre.—p. 90.
Malarial Splenomegaly in Children. Z. Cardenas Sinclair.—p. 94.

Puericulture.—Eyzaguirre remarks that Caron's term, "puericulture," for the systematized scientific care of young children has been adopted in all Latin countries. Cacace prefers terms from the Greek, "nipiology" and "pedology," to distinguish between infants and children up to 6 and beyond.

Revista Médica del Uruguay, Montevideo

May, 1922, **25**, No. 5

Multiple Gunshot Wound: Murder or Suicide? José May.—p. 378.
*Hydatid Cysts in the Brain. L. Morquio.—p. 385.
*Preparation of Patient for Operation. D. Prat.—p. 424.
*Fatal Hemorrhage After Adenoidectomy. A. Volpe.—p. 440.

Hydatid Cysts in the Brain.—Four cases in children are described in detail by Morquio, with the necropsy findings. The symptoms caused by the hydatid cyst were vague at first; months and even years passed in some cases without decisive manifestations. Paresis of one arm or leg was often the first symptom to attract attention. Headache and vomiting may be absent to the very end. One child presented merely unilateral chorea, with slight contracture, and died suddenly, necropsy revealing a cyst as large as an orange in the right rolandic region. In the four cases here described vision had not been impaired, and in two the mind was not affected. The clinical picture varied widely otherwise, but the good general health, the rural origin, and the protrusion and softening of the skull in the region suggested the nature of the brain tumor. Surgical measures may cure when the cyst is small and superficial.

Preparing the Patient for an Operation.—Prat devotes fifteen pages to the minute description of how to insure the best possible conditions for a major operation. His outline calls for a six day preparation, ample supply of fluids, a heart tonic, and anoci-association at the last.

Fatal Hemorrhage After Adenoidectomy.—Volpe found that the coagulation time was normal in the venous blood of the boy of 3 whose large adenoids had to be removed. The boy succumbed to hemophilic hemorrhage. It was known that an uncle had died from hemophilic hemorrhage but the normal coagulating time in the boy had been accepted as testifying that the taint did not affect him. Volpe queries whether the shock of the operation may not have been responsible for the flaring up of the hemophilia. The Bloch method of examination might have revealed the hemophilic taint and indicated prophylactic serotherapy or peptone (Wolf) treatment.

Archiv für Verdauungs-Krankheiten, Berlin

May, 1922, **30**, No. 1

*The Guaiac Test for Occult Blood. J. Vándorfy (Budapest).—p. 1.
*Salt in Gastric Anacidity. B. Molnár, Jr., and G. Heténvi.—p. 8.
Ultimate Condition in Chronic Dysentery. L. R. Grote.—p. 13.
*Technic for Test of Pancreas Function. E. Deloch.—p. 27.

The Guaiac Test.—Vándorfy has found that hemoglobin is more sensitive to guaiac than hematin, when the guaiac test is applied with the routine technic, but this difference is not apparent if a 70 per cent. alcoholic solution of chloral hydrate is used instead of alcohol alone. This modification renders the test much more sensitive. The optimum is with a 0.5 per cent. solution of the guaiac in the chloral-alcohol. He dissolves 2.5 cg. of the pulverized guaiac in 5 c.c. of the chloral hydrate-alcohol and then proceeds with the test as usual. Only a pronounced blue tint can be regarded as a positive response.

The Chlorin Content of the Blood with Secretory Disturbances in the Stomach.—Mólnar and Heténvi comment on the improvement in conditions in regard to gastric secretion in a number of cases of anacidity when salt was supplied in abundance. The patients took 2 gm. of sodium chlorid in half a glass of water after meals. Five of the twelve in this group had free hydrochloric acid when examined three or four weeks later, and in some it approximated normal. All of them declared that appetite had returned and they felt better in every way. Reduction of the salt intake has long been advised in treatment of hyperchlorhydria, and the reverse has now proved its efficacy in the opposite condition, anacidity. They ascribe the unusually large proportion of cases of anacidity encountered since the war to the predominantly vegetarian diet during the war. This entailed exceptional losses in sodium chlorid as it was eliminated with the excess of potassium from the vegetable diet.

Duodenal Test for Pancreas Functioning.—Deloch ascribes to the variability in the technic the conflicting findings from examination of the contents of the duodenum in estimating the external secretion of the pancreas. He has obviated this difficulty by following a certain routine technic for the entire procedure. He begins by pouring 30 c.c. of decinormal hydrochloric acid directly into the duodenum, and then records the amount of secretion that follows (35-65 c.c.), the duration of the secretion (45 to 60 minutes), the alkalinity and the ferments (from 200 to 600 units per c.c. of duodenal contents in normal subjects). There was excessive secretion in seven of the eighteen cases of gastric or duodenal ulcer tested, and hyperchylia was evident in two cases. With deficient gastric secretion there seemed to be a compensatory extra secretion in the pancreas. On the other hand, with catarrhal jaundice there was functional secretory insufficiency in the pancreas. Cholecystitis, pancreas cancer and diabetes mellitus were accompanied with organically conditioned secretory insufficiency. In almost all the cases of pancreas hypochylia, the negative findings with the tests applied to the stools confirmed the unreliability of this means for estimating pathologic conditions in the pancreas.

Deutsche Zeitschrift für Chirurgie, Leipzig

June, 1922, **171**, No. 1-2

*Splenectomy in Congenital Hemolytic Jaundice. K. Mayer.—p. 1.
*Osteochondritis Dissecans. M. Kappis.—p. 13.
*Diverticulum of Appendix. W. Löhr.—p. 30.
*Tuberculin Treatment During Heliotherapy. W. Graf.—p. 57.
Operation for Incarcerated Diaphragmatic Hernia. A. Sohn.—p. 82.
*Duodenal Ulcer After Burn. L. Kirchmayr.—p. 109.
*Metal Substitute for Tibia in Child. G. Golm.—p. 117.
*Epithelium Lining for Permanent Witzel Fistula. G. Hauck.—p. 125.
Isolated Dislocation of Ulna in Ankle. F. Mandl.—p. 130.
Factitious Abscess from Subcutaneous Injection of Saliva. Serdjukoff.—p. 134.

Splenectomy in Congenital Hemolytic Jaundice.—Mayer remarks that only about eighty cases of splenectomy for congenital, inherited, hemolytic icterus had been published up to 1920, half of them in Germany. He had occasion to operate on a young woman and two brothers of 19 and 29, all presenting a very severe form of the inherited jaundice. The father and a great uncle had always been jaundiced but were otherwise normal and strong. The father died from gastric cancer. These three children had always been frail and backward in both physical and mental development. Four other children in the family had died young. The hemolysis increased at times, causing weakness confining to bed for a few days, and these paroxysms had been increasing in frequency and severity. The spleens when removed weighed 1,000, 1,450 and 1,900 gm. The jaundice disappeared completely thereafter in two weeks in the girl of 20 and in four weeks in the two men. It began to disappear the fourth or sixth day, and urobilin to disappear from the urine. The girl has gained 30 pounds, the men, 18 and 20 pounds in weight since, and their faces filled out and lost the previous wrinkled, aged appearance. Full earning capacity was regained after the third month. An eleven year ulceration on the feet of one of the men and an ulcer on the foot of the girl healed completely in a few weeks, and the girl began to menstruate for the first time. The two oldest rejoice in the

change from their former apathy and irritability to a normal attitude toward life. The younger man's goiter and infantile genitals indicate endocrine disturbance, and his mental condition has shown little benefit. The findings in the blood, etc., are tabulated from the three cases for nearly a year. The erythrocytes still display exceptionally low resisting powers, showing that the inherited taint still persists, but the splenectomy has clinically cured the three patients. The spleen seems to act like a multiplier for the morbid phenomena, and its removal is followed by the clinical cure.

Osteochondritis Dissecans.—Kappis reports three cases of this apparently spontaneous separation of the cartilage from the bone, and shows that in every case there was a more or less perfectly healed fracture, with nothing to indicate any pathologic feature in the fracture. He incriminates trauma and mechanical factors, and possibly a predisposition, like the constitution which predisposes to loose bodies in joints. He recently examined a man with loose bodies in both knees and both elbows. In another case he found twenty loose bodies in the knee and around the femur in a woman of 20 after a slight accident to that knee. A still larger number were found in the other knee and femur although this side had never caused any disturbance except for occasional luxation of the patella.

Diverticulum of the Appendix.—Löhr ascribes this formation to some inflammatory process, and discusses its consequences.

Tuberculin Treatment of Bone and Joint Tuberculosis.—Graf gave tuberculin systematically in 100 cases of so-called surgical tuberculosis under systematic heliotherapy in the last year and a quarter. These experiences show that tuberculin is contraindicated in all such cases except when the process is well localized, torpid, and obstinately refractory to the usual measures. Heliotherapy is liable to reduce the tolerance for tuberculin, and it has to be given with extreme care, if at all, and for very short periods, always bearing in mind that the tuberculin is not intended to cure but merely to swerve conditions into a more favorable course. Application of the tuberculin directly in the focus is safer and more effectual, as the reaction can be inspected and estimated.

Chronic Duodenal Ulcer After a Burn.—Kirchmayr reports a case in which there was evidently a causal connection between the chronic duodenal ulcer and a preceding extensive burn on the neck and back in 1907. The boy complained of severe pains in the stomach at once after discharge from the hospital where the burns had been treated, and the paroxysms of pains had returned at times during the twelve years since. They had gradually grown more severe and frequent, rebellious to all internal treatment, coming on two or three hours after meals. A complete cure followed pyloroplasty by Eiselsberg's method plus gastro-enterostomy. A large radiating scar was found in the horizontal portion of the duodenum, with extensive adhesions binding it to the liver, gallbladder, pancreas and transverse colon.

Disadvantages of a Metal Substitute for the Tibia.—In the case illustrated by Golm, the metal prosthesis had answered its purpose in the boy but, as his leg grew, the prosthesis was unable to grow with it, and the consequence was severe deformity of that leg. It was 9 cm. shorter than its mate, with talipes and osteoporosis. The metal rod had been implanted in 1908, and the disturbances became so severe that the leg was amputated in 1920. Golm remarks that the case warns against the use of foreign bodies as substitute for bones in the young.

Healing of a Witzel Fistula.—Hauck reports satisfactory results in two cases from the application of Thiersch flaps to line the fistula. The flap was cut on the thigh and was wrapped around a rubber tube, the raw surface outward, and the tube thus coated was sutured in place in the slanting fistula into the jejunum or stomach. The patient with a fistula into the jejunum died the fiftieth hour, and the flap was found solidly adherent to the intestinal serosa. The one with the fistula into the stomach lived for three months, and the fistula was found lined throughout with epithelium, the transplanted flap having grown to double its former size. In both cases the flap had grown firmly to the tissues, and the patient was relieved from the necessity of frequent change of dressings. The fistula seemed to the patient like one of the natural openings of the body, the "crater" being sutured to the skin around.

June, 1922, **171**, No. 3-6

*Research with Parabiosis. G. Schmidt.—p. 141.
*Innervation of the Diaphragm. W. Felix.—p. 283.
*Ascaridiasis of the Biliary Passages. Tsujimura.—p. 398.
Large Retromammary Angiofibroma. Wiedhopf.—p. 413.
Atypical Partial Appendicectomy. J. Richter.—p. 418.

Parabiosis Research.—Schmidt writes from the surgical clinic in charge of Sauerbruch to describe the present status and the aims of research on animals made to grow together, with reports of extensive experience in this line. Over 140 pages are devoted to the profusely illustrated account of twin and triplet parabiosis of rats. The effect of removal of organs in one of the animals, of burns, of radiotherapy, of ileus, of artificial immunization and infection, of transplanted tumors, etc., the parabiosis of a young and of a senile animal, are some of the problems studied. Each experience opens up new lines of research. One of the illustrations shows a white female rat living in harmonious parabiosis with a black male rat, the tissues uniting them having stretched to form a broad, bowel-filled sac, nearly as wide and long as the body of either animal.

Innervation of the Diaphragm.—Felix reports the results of research on the phrenic nerve and the innervation of the diaphragm, studied from the anatomic, experimental and clinical standpoints. A bibliography of 170 articles is added.

Ascaridiasis of the Biliary Passages.—Tsujimura reports two cases which bring to thirty-three the number of published cases in which ascarids were found in the biliary ducts at operations. In all but eight cases there were gallstones besides. The symptoms from the helminths alone closely resembled those from cholelithiasis.

Medizinische Klinik, Berlin

April 2, 1922, **18**, No. 14

Laceration of the Uterus. Kupferberg.—p. 425.
*Gonococci in Eruption in Gonorrhea. Paschen and Jentz.—p. 428.
*Duodenal Juice in Diagnosis of Intestinal Disease. K. Isaac-Krieger.—p. 431.
Treatment of Climacteric Congestions. J. Halban.—p. 434.
Cancer in Colon or Rectum. E. Wertheimer.—p. 435.
Amyotrophic Paralysis Early in Tabes. W. Schmitt.—p. 436.
*Clinical Early Diagnosis of Syphilis. H. Colman.—p. 437.
Pituitary Extract in Ileus and After Laparotomies. Fervers.—p. 438.
*Dye Colloids in the Service of Serology. H. Hecht.—p. 439.
*Widal's Hemoclastic Crisis Not Reliable. Charlotte Erdmann.—p. 440.
Rudiments of Obstetrics. E. Runge.—p. 441. Cont'n.
*Fatal Cerebral Disturbances from Arsphenamin. C. Hart.—p. 444. Conc'n.

Gonococci in Gonorrheal Eruption.—Paschen and Jentz report what they think is the first case of a petechial eruption in the course of gonorrhea, with gonococci in the blood, in which the gonococcus was found in the depths of the skin. The microscope differentiated it from the meningococcus.

Functional Insufficiency of the Pancreas.—Investigation of the duodenal contents in thirty cases of achlorhydria failed to reveal anything abnormal in the ferment content of the duodenal juice. This settles the question as to the hydrochloric acid being the indispensable stimulus for pancreas functioning. Even in cases of gastrogenous diarrhea, the ferment content of the duodenal juice seemed to be normal, although the stool findings were those hitherto regarded as indicating achylia pancreatica.

Early Clinical Diagnosis of Syphilis.—Colman reports a case of erosion on the lip of a society girl which he decided —but only by exclusion—must be of syphilitic origin. The Wassermann test became positive later. If he had trusted to laboratory tests he could not have eradicated the infection so promptly as he did. He warns against the practice in such dubious cases of giving a dose or two of arsenicals while waiting for developments. Either the lesion is syphilitic or it is not, and if it is, vigorous measures are indispensable from the start.

Dye Colloids in Serology.—Hecht has been trying to make the serologic tests more distinct by staining the fluid, and

by increasing the proportion of colloids in the fluid. He did not succeed with the Wassermann test, but was more successful with the Hecht syphilis and Ficker typhus tests.

The Hemoclastic Crisis as Test of Liver Functioning.—Erdmann applied Widal's test ingestion of a glass of milk, fasting, to induce the hemoclastic crisis, but found the response conflicting in her thirty-one cases. In twenty with unmistakable liver disease there was no reaction in nine, and only three responded positively with the triad of drop in blood pressure, accelerated coagulation and leukopenia.

Fatalities from Arsphenamin Treatment.—Hart reviews fifty-four reports that have been published on fatalities under arsphenamin treatment of syphilis, especially cerebral complications. In Hanser's case, in 1921, there was status thymicolymphaticus, but the fatality was evidently due to an error in technic, the arsphenamin being in a very concentrated and very acid solution. The drug was perfectly dissolved in the fluid, but it precipitated out in the vein, with formation of thrombi in the vein in the arm, followed by embolism in the smaller arteries in the lungs, and this entailed embolism in some minute arteries of the brain. This sequence was evident at necropsy, and confirms the danger from highly acid solutions, the danger being greater, the more concentrated the solution. Death occurred five hours after the obstruction in the pulmonary artery had subsided.

Monatsschrift für Geb. und Gynäkologie, Berlin

May, 1922, **57**, No. 6

Forceps for After-Coming Head. L. Nürnberger.—p. 305.
*Bladder Hernia and Sponge in Bladder. N. Ellerbroek.—p. 341.
Synthetic Substitutes for Ergot. B. Zondek.—p. 347.

Bladder Hernia and Sponge in Bladder.—Ellerbroek's case teaches the necessity for thinking, whenever we are operating for hernia, of the possibility that the bladder may be involved. In this case the bladder involvement had been overlooked, and the resulting disturbances were complicated by a sponge that had been left behind and had worked its way into the bladder. It was removed by way of the vagina, as also in Maxwell's recent case.

Münchener medizinische Wochenschrift, Munich

June 2, 1922, **69**, No. 22

Induced Paralysis of the Diaphragm. F. Kroh.—p. 807.
*Prophylactic Arsphenamin Treatment of Syphilis. W. Schönfeld.—p. 811.
*Menthol-Eucalyptol in Tuberculosis. B. Fischer.—p. 814.
*Family Histories of Workmen. Weichardt and Steinbacher.—p. 816.
Incisions in Plastic Surgery. J. S. Esser.—p. 818.
Goiter in Infants. F. Hamburger.—p. 819.
So-Called Water-Wheel Sound (Bruit de Moulin). Hörnicke.—p. 819.
Laceration of Intestine Due to Self-Reduction of Inguinal Hernia. Hilgenreiner.—p. 820.
The Siemens Roentgen Dosimeter. R. Jaeger.—p. 821.
Incidence of Pulmonary Tuberculosis in Rural Communities. W. Sandrock.—p. 824.
Experiences with the Kielland Forceps. H. Saenger.—p. 824.

Prophylactic Arsphenamin Treatment of Syphilis.—Schönfeld takes the attitude that in all cases in which prophylactic treatment with arsphenamin might be at all considered, it is better not to institute such treatment but to wait until it is possible to establish a clear diagnosis. Suspected cases must be watched over carefully and no means of diagnosis neglected, in order that, in case syphilis becomes definitely established, prompt treatment may be begun.

Intravenous Injections of Menthol-Eucalyptol in Tuberculosis.—Fischer reports bad results from his intravenous injections of menthol-eucalyptol in twelve rabbits, eight of which were inoculated with highly virulent tubercle bacilli of the bovine type and four with human tuberculosis. The injections were not found to have any influence on the course of the disease.

Medical Inquiries into Family Histories of Skilled Workmen.—Weichardt and Steinbacher think there are indications, in some parts of Germany, of a degeneration of the people. They discuss family histories and ways and means by which those who realize the value of eugenics may work against such a tendency. Physicians can play a mighty rôle in the preventing of moral and physical degeneration, if they will only recognize and use their great power and influence in helping to shape the family life of the community in which they practice.

Wiener klinische Wochenschrift, Vienna

May 25, 1922, **35**, No. 21

Treatment of Cardiospasm and Cardiostenosis. Finsterer.—p. 471.
*Test of Functioning of Thyroid Gland. F. Starlinger.—p. 473.
*Echinococcus Anaphylaxis. J. H. Botteri.—p. 473.
Pseudocataract After Injury from Fragment of Copper. A. Hinger.—p. 474.
*Gallstones and Cancer of Gallbladder. L. von Aldor.—p. 475.
"Tuberculotoxic Meningitis." H. Herschmann.—p. 478.

Demonstration of Function and Test of Functioning of Thyroid Gland.—Starlinger considers the thyroid as an individual organ, and conceives that blood that has passed through the thyroid must have acquired specific qualities. The question is whether we possess sufficiently delicate methods to register such changes in the blood. Starting with the theory of Herzfeld and Klinger that fibrinogen represents the first stage in the decomposition of the albumin of an organ, he made refractometric determinations of the fibrinogen content of the arterial and of the venous blood of the thyroid. He tested further the varying sedimentation velocity of the red blood corpuscles, and the results of sodium chlorid flocculation, whereby at the same time a control of the several methods was secured. It is too early to draw any definite conclusions, since so far only fifteen cases have been studied, but he states that in nearly all cases he secured such findings as one would expect from the clinical observation of the cases. In only one case was there no difference to be distinguished between the arterial and the venous blood of the thyroid. He cites the experience of Herzfeld and Klinger with thyroid autolysates that contained no iodin, with which they caused rat goiters to retrogress. They consequently concluded that goitrous degeneration of the thyroid indicates an abnormal predominance of synthesis over catalysis, and that the decomposition of albumin plays an essential rôle in the functioning of the thyroid. In a hyperfunctioning thyroid, then, we would expect to find a diminution of fibrinogen in the venous blood, while in thyroid insufficiency we would expect just the opposite. With the one exception noted, all the findings thus far are in complete accord with this conception. For example, in one case the fibrinogen in the blood from the artery totaled 0.65 per cent. while it was 0.37 per cent. in the blood from the vein; the suspension stability of the erythrocytes averaged respectively 45 and 61, and precipitation was respectively four plus and two plus.

Echinococcus Anaphylaxis.—Botteri says that hydatid cyst fluid may be regarded as a true antigen, since it will produce active and passive anaphylaxis, and furthermore, by a characteristic shock, will desensitize a hypersusceptible organism.

Causal Connection of Gallstones with Cancer of the Gallbladder.—Aldor states that, notwithstanding the fact that the assumption of a causal connection between cholelithiasis and cancer of the gallbladder is common among pathologists, surgeons and internists, his investigations lead him to believe that the only basis for the assumption lies in the frequent coincidence of cancer and gallstone.

June 1, 1922, **35**, No. 22

Modern Therapy of Fractures and Luxations. Ewald.—p. 493. Cont'd.
The Nature and Causation of Leukocytosis. G. Holler.—p. 497.
Case of Latent Pleural Empyema with Acute Peritoneal Symptoms. W. Goldschmidt.—p. 499.
Case of Little's Disease Following Cesarean Section. R. Tauber.—p. 499.
*Phonetic Symptom in Affections of Lungs or Pleura. E. Fröschels and F. G. Stockert.— p. 500.
*Action of Arsenicals. Adaptation of the Organism Thereto and Poisoning Therefrom. K. Ullmann.—p. 502. Begun in No. 20, p. 455.

Phonetic Symptom in Affections of the Lungs and Pleura.—Fröschels and Stockert report the peculiar auscultation finding that in many patients with pneumonia or pleuritis certain vowels take on a distorted value as heard through the stethoscope or better still with the examiner's ear directly against the patient's chest. In a case of pneumonia of the left inferior lobe, *a*, *e*, *o* and *u* (pronounced as in German) sounded all alike, as a distinct *i*. In a case of pleuritis with effusion, in certain regions, *o* sounded as *e*, *u* sounded like *i*. Ten similar cases are cited. The writers hold that the phe-

nomenon may possibly be partially explainable by the physical quality of vowel tones as described by Helmholtz as consisting of a fundamental tone and a series of harmonious overtones. Perhaps we may then assume that the identity of a vowel is lost or obscured if certain overtones are wanting or are added where they do not belong. Stumpf's experiments also seem to substantiate the Helmholtz theory.

Action of Arsenic, Habituation Thereto and Poisoning Therefrom.—Ullmann devotes eleven pages to the discussion of the action and by-effects, the therapeutic effects and the injuries caused by the administration of arsenicals. Although, in recent years, much progress has been made in adjusting the dosage according to the age, sex, body weight and constitutional qualities of the patient, his clinical observations and animal experiments have convinced him that, in order to determine the dosage that will accomplish the best therapeutic results, more than mere posometric considerations must be taken into account, for the main factor in determining dosage is the estimation of the proportion of the therapeutic dose that passes through the circulation into the various organs of the body and how such portions are acted upon and utilized by the organs. He finds that there is too much of a tendency to regard various methods of administration: parenteral (parenchymatous), internal and intravenous, as having the same medicinal and toxic effect, whereas that is far from correct. It can no longer be held that the proportion of an arsenical that is eliminated in the urine and the stools is an exact indicator of the therapeutic effect attained. Such a conception is especially inapplicable to the present-day intravenous method. That arsenic introduced by the intravenous method exerts relatively the slightest effect, is due to the rapid elimination and the fact that the arsenical remains such a short time in the blood and the liver. While spirochetes that have been in contact with arsphenamin only a short time may retain, to a certain extent, their mobility, they lose at least their ability to multiply. When the arsenical comes in contact with the parasites of the organism, these are not necessarily killed at once; small doses may have even a stimulative effect so that the number of microorganisms will increase for a time, while sterilization is brought about later. He cites among the affections that demand especial caution or constitute a contraindication for arsphenamin treatment: affections of the liver, kidney, and the digestive tract, and alcoholism. In pregnancy, a special test of kidney functioning is recommended. In doubtful cases a beginning small dose, to be gradually increased, is indicated. He warns that arsenic has an affinity for the liver and mercury for the kidneys.

Zentralblatt für Gynäkologie, Leipzig

April 22, 1922, **46**, No. 16

Recognition of Sterility in Women. W. Lahm.—p. 609.
Findings in the Capillaries in Eclampsia. Nevermann.—p. 617.
Genital Corpuscles in Clitoris and Labia Minora. Geller.—p. 623.
A Case of Vagitus Uterinus. H. Krause.—p. 625.
Proteotherapy and the Significance of the Protective Colloid in Silver Hydrosols. J. Voigt.—p. 628.
Case of Diphtheritic Infection in Newborn Twins. E. Weber.—p. 631.

Nederlandsch Tijdschrift v. Geneeskunde, Amsterdam

May 13, 1922, **1**, No. 19

*Own Urine Test for Tuberculosis. J. C. Schippers and S. B. de V. Robles.—p. 1868. Idem. W. F. Enklaar.—p. 1876.
*Hypertrophied Prostate. W. A. Mijsberg.—p. 1879.
Cancer Institute in Netherlands India. A. E. Sitsen.—p. 1890.

The Wildbolz Urine Test for Active Tuberculosis.—Schippers' verdict from extensive trials is unfavorable, as to its value as a sign of active tuberculosis. He warns further that the individual sensitivity of the skin varies so widely that extreme caution is necessary in estimating any reaction. Enklaar's experience, on the other hand, indicated that a very positive reaction testifies to an active tuberculous process, and a negative response—even with positive skin tuberculin reaction—seems to exclude an active process.

The Prostate and Its Hypertrophy.—Mijsberg's comparative research on apes and man throws light on hypertrophy of the human prostate. The middle lobe in apes is much more highly developed than in man. The loss of testicle functioning releases the prostate from an inhibiting influence. Causal treatment, therefore, calls for restoration of the testicle hormone before the hypertrophy is installed. He adds that it is inconceivable that the testicles of animals can secrete a hormone effectual in this line in man. In animals, nothing of the nature of true hypertrophy of the prostate has ever been observed. Human testicles or preparations of human testicles are the only ones to be considered in clinical cases.

May 20, 1922, **1**, No. 20

Dangers of Diphtheria. J. Munk.—p. 1952.
Diphtheria in Country Practice. J. H. Wieringa.—p. 1956.
Some Epidemiologic Questions on Diphtheria. O. J. Pool.—p. 1962.
*The Flea in Transmission of Plague. N. H. Swellengrebel.—p. 1968.
Gastric Ulcer and Gastric Cancer. J. Goedhuis.—p. 1973.
*Foreign Body in the Pleura. F. O. Bruijning.—p. 1976.
Scleroderma. G. A. M. van Balen.—p. 1978.

Transmission of the Plague.—Swellengrebel presents evidence that not only the rat flea but the human flea must be taken into serious consideration in the transmission of plague. In the tropics, the rat may play the preponderant rôle, but elsewhere, transmission from man to man by fleas or other vermin must be counted with.

Foreign Body in Pleural Cavity.—The woman of 22 had some ribs resected in treatment of empyema. She had a cough, and a year later, during a pregnancy, the sputum was ocasionally blood stained, and this continued for three years. During the last year she had complained of pain in the left side, and a slight apical tuberculous process was diagnosed. Roentgenoscopy yielded the surprising finding that a large drainage tube lay in the right pleural cavity. The shadow extended past at least six of the right ribs, although the pain had always been in the left side. The disturbances from this foreign body during the four years it had been in the pleura were comparatively insignificant.

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The Exposition at Amsterdam: "Man." P. Muntendam.—p. 2040.
*Acute Pancreatitis. J. G. Remijnse.—p. 2043.
*Laryngeal Tuberculosis in the Netherlands. C. M. Hartog et al.—p. 2054.
*Membranous Enteritis. J. van de Moer.—p. 2057.
Prolapse of Inverted Puerperal Uterus. T. B. Philips.—p. 2058.
*Uncontrollable Fatal Vomiting. J. de Hartogh, Jr.—p. 2060.
Present Status of Blood Transfusion. S. M. Kropveld.—p. 2063.
The Antimalaria Campaign in Northern Holland. Muntendam.—p. 2096.

Acute Pancreatitis.—Remijnse gives the history of 15 cases of acute pancreatitis with recovery of all but 5. He explains it as an acute necrosis from sudden irruption into the pancreas outlet of infected and chemically altered bile. It is not due as a rule to infection of the pancreas itself. Drainage of the biliary apparatus is the main thing in treatment. Any tendency to chronic pancreatitis calls for prolonged drainage of the bile ducts. In acute pancreatitis, the bleeding, suppuration, etc., are secondary to the acute necrosis. The sudden agonizing pain in the stomach region and back, spreading to right or left, with vomiting, cyanosis and signs of collapse, but no fever, may follow a heavy meal, the pancreas thus being called on for extra functioning. In 35 of 96 operative gallstone cases he found the head of the pancreas abnormally large and hard, and at every operation for acute pancreatitis he found the bile passages more or less pathologic, with gallstones in 50 per cent. Certain attacks of gallstone colic may represent merely attacks of acute necrosis of the pancreas, which recuperates spontaneously, and the involvement of the pancreas may escape detection.

Laryngeal Tuberculosis in the Netherlands.—Mentioned on page 226.

Membranous Enteritis.—Van de Moer has encountered two cases of membranous enteritis developing after the use of morphin by the mouth or hypodermically.

Fatal Uncontrollable Vomiting.—Hartogh relates that nothing could be found to explain the vomiting in the previously healthy woman of 40 with two children. There were absolutely no other symptoms; one specialist consultant after the other reported negative findings. Death occurred in the hospital the seventh day after the vomiting had begun; consent to necropsy could not be obtained.